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NAVAL ESTIMATES NEARLY A HUNDRED MILLIONS.

The estimates for the navy for the year ending June 30, 1903, just made public, are the heaviest on record. The total amount is $98,910,984, against $77,924,535 appropriated for the current year. These estimates have been made after consultation with President Roosevelt, who has declared that the navy of the United States must be second in power to that of France. Secretary Long says that the estimates do not cover any recommendations for increase of the navy over that already authorized, but it is more than likely that he will recommend three new battleships, two armored cruisers and a number of small gunboats. The chief increases in the estimates are $2,600,000 for construction and $2,000,000 for armor. Following are some of the important items: New battery for the Newark, $175,000; new batteries for the Albany and New Orleans, $200,000; reserve guns for ships of the navy, $500,000; floating dry dock at Portsmouth, N. H., $500,000, making the total for that yard $1,644,575. A total of $1,127,700 for new works at the Boston navy yard, which includes a plant for housing and storing torpedo vessels and new buildings. The estimates for new improvements at the New York navy yard aggregate $3,110,000, which includes $2,000,000 for the purchase of land, and $200,000 for barracks for enlisted men. The new estimated items for the Norfolk yard aggregate $1,208,500, which includes $350,000 for the purchase of land.

The estimates for the naval station at San Juan, Porto Rico, are $2,613,000, and include $1,000,000 for a masonary dry dock; $500,000 for the purchase of land, $250,000 for dredging, and $200,000 for the extension of coaling facilities. An estimate of $650,000 is made for a plant for housing and storing torpedo vessels at Pensacola. An estimate of $108,000 is made for the naval station at Tutuila, Samoa. An estimate of $381,000 is submitted for the Cavite naval station, which includes $200,000 for a refrigerating plant. Estimates are made for a complete naval station at Olongapo, P. I., amounting to $1,443,000. Other estimates are: Naval magazine near Boston, $500,000; naval magazine near Portsmouth, N. H., $400,000; naval magazine, Puget sound, $100,000; defenses for insular naval stations and coal depots, $500,000.

FAVORS A DEPARTMENT OF COMMERCE.

President W. H. Moore of the National Good Roads Association is very strongly in favor of the creation of a department of commerce with a cabinet officer at its head. He has been consulting various commercial organizations on the subject, and he finds a practically unanimous feeling in favor of such legislation. Speaking on the subject he said:

"The measure, as proposed and as it will be backed by the good roads people, provides for the establishment of a department of commerce and transportation, or commerce and public works. It is intended to establish under its direction a bureau of good roads. At present the bureau of public road inquiries is under the department of agriculture. It is also the intention to place bureaus now under the direction of the interior and treasury departments under the proposed department of commerce. I have talked with a great many members of congress this summer, with the result that I am confident the new department will be created at the next session. Every senator and representative I have seen favors it. At Buffalo I had a long talk with Senator Hanna on this subject. He is for the bill and has agreed to do all he can for it. No one expects the government to build the roads. Such a proposition would be foolish. The government can, however, build sample roads, and thereby let the people know what the advantages are. The states must build the roads. The railroads are interested in a movement for good roads because they realize good roads are essential to their interests. At present shipments practically stop in a large part of the country for five months every year because the farmers can not get to the railroad stations. With good roads all over the country the traffic would be distributed through twelve months of the year. This is the reason the railroads want good roads."

MR. BURTON ON THE RIVER AND HARBOR QUESTION.

Representative Theodore E. Burton, chairman of the committee on rivers and harbors of the house of representatives, is much pleased over the success of the national congress of rivers and harbors which was held in Baltimore last week. He thinks that it will have a direct influence in shaping legislation in the future. In discussing the river and harbor question in general he said:

"In my judgment there is now a substantial agreement throughout the country on the question of the appropriation of funds by the government for the improvement of rivers and harbors. Whatever may have been true in former years, few opponents of these appropriations can now be found. The important question is just what projects shall be selected for favorable action. In framing a bill which shall include only projects of general interest and exclude those only local, or which would involve expense greatly out of proportion to the results accomplished, great care is required. It is to be regretted that the majority of the critics who have attacked river and harbor bills have based their objections upon grounds not well founded. No criticism is more frequently made than the assertion that a large share of the appropriations include items for the improvement of insignificant streams, creeks and ponds being the terms most commonly used. Nothing could be farther from the truth. If the energy exhausted in injudicious attacks upon congress could be exercised in judicious criticism and intelligent assistance to those who have the work in hand, congress would find the work of framing the bill much easier and the outcome would probably be more beneficial to the people."

Vickers Sons & Maxim launched at Yarrow, England, this week the first of the submarine boats of the Holland type which they are building for the British admiralty.

BUSINESS OUTLOOK ON THE GREAT LAKES.

The confidence of lake vessel interests in a continuance of the present active condition of business, especially in iron and steel lines, is best shown by the orders that are still being placed for new vessels, which can not, in view of the crowded condition of the ship yards, be completed until June or July of next year. Although the grain movement from the northwest, which it was thought would be very heavy in the closing weeks of the present season, is not at all up to expectations, there has been business enough in ore and coal to advance freights to figures that would be very profitable to the ships if it were not for unusual delays at Lake Erie ports, where the supply of railway cars has been so short as to make the season one of general worry and dissatisfaction to the shippers. The greatest shortage is in the movement of coal, but in one respect this may prove an advantage to the ships, as there will certainly be no surplus of coal for another year at upper lake ports when the season ends. Rates on ore are now 90 cents from the head of the lakes, 80 cents from Marquette and 65 cents from Escanaba, with coal at 60 cents to Lake Michigan ports and 35 cents to Lake Superior, and a scarcity of vessels prevailing in both lines of trade. Referring to the iron trade situation, which will of course have the usual effect upon future business, the Iron Trade Review says: "All indications for the immediate future are on the side of strength and sustained demand in iron and steel. The market for Bessemer pig iron, based on $15.25 a ton at Mahoning valley furnaces, is much firmer than it has been for some time past. In foundry iron, too, the situation is very strong, buyers in some cases contracting for deliveries extending into the middle of 1902. The steel market still presents the dual phase of scant supply for early needs with prices well maintained. Steel rail business for next year continues to grow in a phenomenal way. There are now on the books new orders for 900,000 tons for 1902, making with what is carried over a total of 1,250,000 tons. Many deals are pending, including 50,000 tons for the Illinois Central, 40,000 tons for the Wabash and 100,000 tons for the Union Pacific."

MORE ORDERS FOR LAKE SHIPS.

It would seem from developments of the past few days that ship yards of the great lakes engaged in the building of steel vessels not only have enough new work to keep them employed until the opening of navigation next spring, but will soon have orders on their books running into July or August next. The American Ship Building Co. has just closed a contract with the Western Transit Co. of Buffalo for a large package freight steamer that is to be completed in June next and will probably announce within a few days orders for two more large ore carriers. The Craig Ship Building Co. of Toledo has just closed for a steel steamer of 204 ft. keel length that will be adapted to lumber trade, this making the third order which they have for next year, in addition to two steamers for Atlantic fruit trade now nearing completion and which it is expected will go to the coast before the close of navigation this year. The Jenks Ship Building Co. of Port Huron still has room for a large freighter which they can deliver early next season, and it is now probable, in view of the demand for ships, that they will not have much difficulty in securing an order from one of two or three parties with whom they are figuring. It has been rumored several times of late that the Ann Arbor Railroad Co. has made arrangements for the construction of a steel car ferry to be of about 5,000 H.P. and to cost about $300,000, but no such contract has as yet been closed. Negotiations for such a vessel have been taken up with the ship builders, but the contract is probably a matter of the distant future. The Western Transit Co. steamer above referred to will be built at the Chicago works of the American company, and will cost about $275,000. She will be a duplicate of the package freight steamer for the same company now nearing completion at Buffalo. The dimensions are 343 ft. over all, 325 ft. keel, 44 ft. beam and 28 ft. depth. She will have quadruple expansion engines with cylinders of 19, 27½, 40 and 58 in. diameter and 40 in. stroke. Steam will be furnished by three Scotch boilers 11½ ft. in diameter and 11½ ft. long, to be allowed 210 lbs. steam pressure.

The 204-ft. steel boat to be built at the Craig works is for Charles Beatty of Buffalo, and others. Cleveland parties are interested in the vessel. Her beam will be 40 ft. and molded depth 16 ft. The power will be in triple-expansion engines of 15, 25 and 42 in. cylinder diameters and 36 in. stroke, supplied with steam by two Scotch boilers of 11 ft. diameter and 10 ft. length. The equipment will be modern in every way, including two winches on deck, cargo booms and tackle, electric light throughout, steam windlass, steam capstan, etc. A vessel of this kind could of course be readily transferred to salt water. She will carry 1,250,000 ft. of lumber or 2,000 gross tons of ore; cost, about $116.000.

Statistics collected from the makers by the British Iron Trade Association show that in the first half of the year 1901 the total production of pig iron in the United Kingdom was 3,884,544 tons, as against 4,540,403 tons in the first half of the previous year, a decrease of 655,859 tons. This indicates a total production in 1901 of less than 7,800,000 tons. The production in 1900, as shown by British Iron Trade Association statistics, amounted to 8,908,570 tons. For 1899, according to government reports, it was 9,421,435 tons. If the output in the United States this year reaches 15,500,000 tons, as now seems likely, it will be nearly if not quite double that of Great Britain.—Iron Trade Review.

The Kaiser Wilhelm der Grosse of the North German Lloyd line has just beaten her own record. Her time from Cherbourg was 5 days, 17 hours and 22 minutes, which beats by 24 minutes her own previous best record, made in November, 1899. The Kaiser Wilhelm's average hourly speed was 22.23 knots. The Deutschland's best hourly record is 23.51 knots.

REVIEW OF SHIP BUILDING.

ALL OF THE LEADING COAST SHIP YARDS ARE WELL STOCKED WITH WORK —NEWS FROM VARIOUS CITIES.

An excellent illustration of the revival of ship building—nearly all for home trade, of course—is contained in the subjoined dispatches from the ship yards of the country. All of the yards of importance are busy and some of them are contemplating extensions to care for their growing trade. The great expansion in the industrial world is probably better exemplified in ship building than in any of the industries. All of the yards have sufficient contract work to carry them well into 1902. Following is a review of the work now actually under construction. It should be added that there are several orders for vessels in contemplation which, of course, are not included in the review.

AT NEWPORT NEWS.

Newport News, Va., Oct. 15.—Not since the founding of the ship yard at this place, ten years ago, has ship building attained the proportions of its present scale. The yard now is and has been for some time worked to its capacity. Gen. Supt. Walter A. Post is authority for the statement that in the immediate future vast sums will be expended in the expansion of the plant in order to meet the demands of the ship building boom. At present $14,000,000 are invested in the plant and 7,000 men are employed. Here is the largest dry dock, just constructed, in the United States. Last year four ships, all of large size, aggregating 37,600 tons displacement and costing $9,600,000, were completed. The greatest of tonnage on hand at any one time last year was 131,200, costing $25,300,000. So far this year three vessels, aggregating 26,100 tons, costing $5,650,000, have been completed, and two others, aggregating 14,600 tons, costing $1,650,000, will be completed before the end of the year. At one time this year 145,100 tons, costing $28,350,000, were under construction. Now ten ships—men-of-war and merchantmen—aggregating 119,000 tons, costing $25,180,000, are building. The battleship Illinois is one of those completed this year.

ON THE DELAWARE RIVER.

Philadelphia, Pa., Oct. 15.—There are at present building in the six principal ship yards along the Delaware river seventy-one vessels. The total registered tonnage is 211,500. The value of this work approximately is $29,700,000. Twelve thousand men are directly employed, and over $175,000 is paid each week in wages. Naturally most of this work is in the yard of the William Cramp & Sons Ship & Engine Building Co., where sixteen vessels are being completed. These represent a total tonnage of 122,000, valued, all told, at $19,000,000. All of the plants are working practically at fully capacity, though with the approach of cold weather and with the shortening of the days a portion of the force will soon be laid off. The outlook is extremely encouraging, every yard having inquiries and invitations to bid on merchant ships of practically all types, principally for the coastwise trade.

AT BALTIMORE.

Baltimore, Md., Oct. 15.—During 1900 forty-four vessels, representing 15,329 tons and valued at $1,645,570, were built in Baltimore. The output this year will be greatly in excess of that of last year. Since January the Maryland Steel Co. has floated the American steamer Lyra of 5,000 tons capacity, the 300-ft. steel dredging steamers Thomas and Mills, and a steel car float, 340 ft. long, which accommodates twenty-eight railroad cars. The company has just completed a 500x100-ft. floating steel dock for Algiers. It is building two 650-ft. Atlantic passenger liners for the Atlantic Transport line between New York and London, and three 30-knot torpedo boat destroyers. The Columbian Iron Works completed the revenue service steamer Seminole and is finishing the 24-knot torpedo boat Tingey. The Spedden Ship Building Co. is finishing a lightship for the government and has built five steel tugs. The tonnage launched and on the way amounts to 80,000 tons carrying capacity and a valuation of $7,700,000. Baltimore has eight other ship yards in addition to those mentioned, equipped to build Chesapeake Bay vessels, but their work this year has been confined to repairs. At least $5,000,000 is invested in ship building plants, which give employment to about 2,500 men. But two plants are equipped to construct modern sea-going steamers. One of these, the Maryland Steel Co., has been crowded with work for two years. The other, the Columbian Iron Works, had all they could do until the illness of its president sent the concern into the courts to straighten out its finances. Recent extensions in ship building plants include the addition of several million dollars to the capital of the Maryland Steel Co. and the construction by the William Skinner Ship Building Co. of a dry dock to accommodate steamers 600 ft. long. The Spedden Ship Building Co. doubled its capacity two years ago and this year. William E. Woodall & Co. bought a large tract of land adjoining their yard for increased facilities.

AT CAMDEN, N. J.

Camden, N. J., Oct. 15.—There are two ship building concerns of importance in this city, the New York Ship Building Co. and John H. Dialogue & Son. The plant of the former company comprises 136 acres. The first boat was completed early this year, and is designed for the export oil trade. Four freight steamers are now on the ways. Their average tonnage is 6,000. Within a month the keels will be laid for two steamers designed for freight purposes, each 620 ft. long and each of 18,000 tons burden. Eight steamships will be completed this year. Six large steamships can be built side by side under the roofs of this plant. The same can be done with three of the largest battleships ever constructed for the United States government. Three thousand men are employed on full time. One thousand more will probably be employed on the completion of the works. John H. Dialogue & Son constructed last year five vessels, of a gross tonnage of about 8,000. At present there are fours steamers, of a gross tonnage of about 6,000 tons, on the ways. Four more similar vessels will probably be constructed this year. Five hundred men are now working on full time.

AT NEW LONDON, CONN.

New London, Conn., Oct. 15.—New London is experiencing a ship building boom. Within the last year two plants have sprung into existence that represent an outlay of several hundred thousand dollars. The largest of these is the Eastern Ship Building Co., situated on the east bank of the Thames river at Groton, where two monster freight steamers are being built for James J. Hill of the Great Northern railroad. These steamers will be the largest freighters ever constructed, and will ply between the Pacific coast and Oriental ports. The other ship building plant, erected during the last summer, is the property of the Thames Boat Co. This company has a modern dry dock, capable of hauling out the largest vessels sailing along the Atlantic coast. A number of vessels will be built at this plant in the next few months. The Thames company has already spent $300,000 for buildings and machinery. The ocean steamers at the Eastern Ship Building Co.'s plant will be ready for launching about Aug. 1, 1902. These vessels are about one-third completed.

AT WILMINGTON, DEL.

Wilmington, Del., Oct. 15.—The ship building industry in this section is bright, as there are now nine vessels on the ways and all the yards have orders on hand. During the present season eight vessels, with a tonnage of 7,916 tons, valued at $2,500,000, were built. Ship building was retarded on account of the machinists' strike. In 1900 there were thirty-four vessels, with a tonnage of 25,189 tons, built at a value of $8,000,000. In the Delaware ship yards there are employed at present 4,000, and all yards are working full time.

AT QUINCY, MASS.

Quincy, Mass., Oct. 15.—Within sixteen months there has been established at Quincy, Mass., an up-to-date ship yard. The Fore River Ship & Engine Co. is engaged in construction of the protected cruiser Des Moines, the torpedo boat destroyers Lawrence and MacDonough, the first-class sea-going battleships New Jersey and Rhode Island, and the first seven-masted schooner ever built. While this has been going on the yard has been built up to meet all of its requirements, and soon, when construction of the two battleships is well under way, about 3,000 men will be employed. The Lawrence and MacDonough were launched in 1900. Their tonnage is 489 tons each, contract price $24,000 each. The Des Moines, to be launched early in November, has a tonnage of 3,500, contract price $1,065,000. The largest steel schooner to be launched next spring has a tonnage of 10,000 and will cost $275,000. The capital invested by the company is $3,000,000. Although the yards are not worked to full capacity, the capacity will be doubled within a year. The company has also contracted for the largest ship rolls for bending plates ever put up and has itself taken the sub-contract for the massive forging for this machine, only possible because the yard has already set up one of the three largest steel hammers in this country. To complete the equipment there are now being erected oil frames and tanks which will temper pieces 50 ft. long weighing 25 tons. The yards will also have a powerful gantry crane, which will travel along the sea wall of the receiving basin. Electricity is used exclusively for driving power at this ship yard.

AT SEATTLE, WASH.

Seattle, Wash., Oct. 15.—During the last year 216 vessels and sea craft of various kinds were built in this customs district. Of this number forty-one were steamers, tugs, etc., fifteen were fishing and sealing schooners, and 150 were great barges and lighters for Alaska work, including two government vessels, on which the yards are still at work in this district. The total tonnage reached 85,500, including the two uncompleted government vessels. The amount of money represented in vessels built during the last year reached $5,800,000. In this district about 3,000 men find employment in ship building and ship repair yards, and the amount of money invested in these yards can be conservatively estimated at at least $5,000,000. Plans are under way for enlargement. The latest contract for ship building here is that placed by the Globe Transportation Co. for ten four-masted wooden schooners, each to have 1,200 tons capacity. Moran Bros. Co. have the greatest plant in this district. Two sailing vessels having 2,400 tons capacity have just been completed at this plant. It is at this plant that the $3,000,000 battleship Nebraska is being built. Ship building here is in its infancy, and for a time demands for vessels were so great that vacant spaces along the beach adjacent to every town on Puget Sound were occupied by ways where individual contractors were building schooners, small steamers, tugs, etc. The largest plants anticipate an increase of capacity that will drive from the field these small contractors.

AT TACOMA, WASH.

Tacoma, Wash., Oct. 15.—Tacoma has two ship yards, one of which was constructed during the present year. Both yards are now working to their fullest capacity, and about 120 men are regularly employed. Last year there were but fifteen men employed at the ship yards. The Crawford & Reid yard turned out seven boats in 1900, with a tonnage of 1,200, costing $200,000. Thus far this year eight boats have been launched, having a tonnage of 2,200, and costing $400,000. Plans are under consideration for extensive improvements to increase the capacity. The Tacoma Ship Building Co. has two vessels on the ways, which will be launched next month. They will have a combined tonnage of 2,500 tons, and will cost about $150,000. Work has recently been commenced on an extension of the plant, and several keels will be laid as soon as suitable buildings have been erected.

AT RICHMOND, VA., AND OTHER POINTS.

Richmond, Va., Oct. 15.—The Wm. R. Trigg Co.'s ship building plant was established about four years ago, and it has already built seven torpedo boats and torpedo boat destroyers for the government. It has on hand contracts that will keep the force busy for a year. Among these contracts is that for the first-class cruiser Galveston. There are about 1,000 men employed and something over $2,000,000 invested. The plant is working to its fullest capacity. The capital stock has recently been increased, and the plant will be enlarged to meet all the demands of the ship building boom.

In its last issue the Review gave a summary of ship building in the Bath district. There have been launched in the Bath district so far in 1901 twenty-six merchant vessels with a gross tonnage of 37,500. About 2,000 men are now employed in the ship yards at Bath and if the wooden yards were running at their full capacity probably 500 more could be employed. At the present time the Bath Iron Works have contracts aggregating $6,000,000, which include a battleship and a large ocean steam yacht. In Arthur Sewall & Co.'s yard there are being built two four-masted steel ships, one of them for the Standard Oil Co. Work is to be begun at once on the construction of a five-masted steel schooner. In the wooden yards the contracts include one steamship for the Kennebec-Boston line with an option on two similar steamships, and also five schooners and two barges.

SOME FACTS CONCERNING THE SCUTTLING OF SHIPS.

By LAWRENCE IRWELL.

The captain of a ship is monarch of all he surveys, when away from land and when there is no other ship above the boundary line of sea and sky. As a consequence, there may be said to be comparatively little difficulty in his way, should he propose to scuttle his ship, either to assist or to injure the owners of it. For this reason, the punishment for scuttling has always been very severe all over the world. By an act of congress passed in 1804 it was enacted that "any person not being an owner who shall, on the high seas, wilfully and corruptly cast away, burn or otherwise destroy, any vessel unto which he belongeth, being the property of any citizen, or citizens of the United States, or procure the same to be done, shall suffer death." The British laws are similar, and a man named Codling was hanged on the sea shore of the county of Kent about 1805 for scuttling a vessel in order to obtain the money for which she was insured. I believe that this was the last time the death penalty was carried out in an English-speaking country for ship-scuttling, and less drastic laws now prevail, the punishment being a long term of imprisonment coupled, of course, with the cancelling of certificates when the offenders are officers.

In 1866, a man named Berwick was convicted of being accessory to the scuttling of several fully insured sailing ships belonging to a firm of which he was a member. The plan adopted by this proficient ship-scuttler was remarkable for its extreme simplicity, and it stood the test of many years of active service, for he eventually confessed that he had defrauded the underwriters by causing no fewer than nine ships in first-class condition to be scuttled during the period of twenty years immediately preceding his last venture. His mind originated the plot each time; but sea-faring men were the necessary instruments for carrying out his ideas. He would prevail upon needy and not over-scrupulous officers to sink their respective ships when it was in their opinion most convenient; and he paid handsomely for the services so efficiently rendered in these extraordinary transactions. Fortunately for the underwriters, however, this methodical ship-destroyer either had his caution dulled by the unprecedented success which attended his investments, or else he made an error in his calculations. The hand of the English law gripped him firmly at last, and the shipping world marveled at the possibility of carrying out a fraud of this character for so long a time without detection. The chief perpetrator and his three nautical assistants were given long terms of imprisonment. A ship named the Severn was the cause of their misfortune. She sailed from England ostensibly for China, in a seaworthy state, loaded with valuable freight; but the crafty conspirators had arranged to put an end to her career long before she reached the Celestial empire. In accordance with this understanding, three large holes were bored in the after part of her hull below the water line, by means of the carpenter's tool known as an augur, almost as soon as the shores of England had disappeared from sight. Wooden plugs were carefully fitted into the holes thus made, and admirably served the purpose for which they were designed. Any one of them could be withdrawn and replaced at the will of the operator, concealed from the curious eyes of the sailors; and it was quite easy to keep the spurious leak both under control and intermittent until the time arrived that was considered suitable for the abandonment of the vessel by the three who were in possession of the secret. An accident, however, interfered with the well concocted plans of these men. One of the plugs was accidentally broken, the inrushing water could not be kept out, and the ship was of necessity abandoned sooner than was proposed. One of the men named Webb had taken an active part in some of the previous successful scuttlings for the same speculative owner, and after sentence had been passed upon him, he disclosed to the underwriters the full details of at least one case. He had sailed from Glasgow to Havana with a cargo of coal in the ship John Brown, which disappeared on the voyage, although all hands were rescued by a passing ship. She was scuttled by Webb, but the unsuspecting underwriters paid the large sum for which she was insured without inquiry. Before leaving Glasgow, a partition in the hold was built by a carpenter from the shore. In this way a clear space was left below the mate's cabin, so that, after getting to sea, a hole was cut in the cabin floor, enabling Webb to go down in the hold unperceived by anybody, and pierce the vessel's side below the water line with an augur. A similar system was followed in the other cases, and fickle fortune seemed to smile upon this iniquitous conspiracy to rob the underwriters. As has been related, however, the malefactors were discovered and were properly punished.

The next case of scuttling that is on record is that of the Nova Scotia bark L. E. Cann. It is perhaps the most nefarious example that has come to light during the past fifty years. In November, 1881, this wooden sailing ship was in the harbor of Vera Cruz, Mexico, awaiting a charter, her captain being a man named Brooks. She was in good condition, was quite as well supplied with stores as ships of her caliber usually are, and, under ordinary circumstances, should have carried a cargo to any port without accident. Brooks had held his position for about two years and had made several satisfactory voyages as her commander. His uncle owned a sixteenth part of the ship, and covered the risk by insurance in the accustomed manner. In February, 1882, this part owner wrote to his agents asking them to insure his interest in the vessel for an additional $500; but this was not done, because the agents had just previously insured her under instructions from the managing owner. The L. E. Cann and her prospective earnings were insured to their full value, and possibly in excess of it. At Vera Cruz a conspiracy was entered into between Brooks and a Spanish merchant named Compos, who transacted the ship's business at that port, which boded ill for the profit account of such persons as had insured her. Compos agreed to put a comparatively worthless lot of lumber aboard as cargo, and to insure it heavily, as though equal in value to similar cargoes sent from Mexico. Brooks agreed to take part of this freight aboard at Vera Cruz, to complete loading at another Mexican port, and then to sail toward New York, the ship to be scuttled at the first favorable opportunity. Accordingly, the L. E. Cann was loaded with a cargo which was only worth about 40 per cent. of the amount set forth in the bills of lading. Compos insured the cargo without any difficulty and awaited the course of events. Brooks, for his share in the transaction, was to receive $6,000. One-third of this sum he received on signing the bills of lading at Vera Cruz, one-third at the next loading-port, and the balance was to be paid to him immediately the unsuspecting underwriters had settled in full.

Before starting, Brooks wrote to the managing owner to the effect that the ship was chartered to take a cargo from Mexico to New York for the sum of $6,000 and they insured the freight for that amount. The vessel left Mexico at the end of March, 1882, and a month afterwards her master made an attempt to carry out his criminal contract. While in the gulf stream, the L. E. Cann was observed flying signals of distress, and apparently in a sinking condition. An American schooner came to her assistance in compliance with her request. A boat from the waterlogged bark brought all her crew to the waiting schooner, and the L. E. Cann was abandoned to her fate, a dangerous obstruction to navigation. The schooner brought the shipwrecked sailors safely to Philadelphia. Unfortunately for Capt. Brooks, the bark was not as easily scuttled as he supposed. During the month of May she was fallen in with, strange to say, by a specially fitted salvage steamer, which towed her to Norfolk, Va. There she was placed in dry dock, and the reason for her condition became clearly revealed even to the most superficial observer. No less than fifteen augur holes appeared in her hull below the water line, and she would undoubtedly have sunk had it not been for her cargo of lumber. The salvors were awarded $5,000 to compensate them for their labor and expenditure, and to pay this the L. E. Cann was sold by order of the United States district court. At an auction sale only $3,000 was offered for her, and after the sale this amount was paid to the owners of the salvage steamer. Brooks confessed that the holes found in her hull had been bored by him, and the shipper of the bogus cargo, thinking that discretion was the better part of valor, did not demand the insurance money. The vessel herself, however, was insured for $5,000, and her managing owner asked for that sum upon the ground that she was "a constructive loss," which means that it would cost more to recover her from the salvors than she was worth before the scuttling. He could not, of course, get possession of her without paying the balance due for salvage, whatever price the buyers might want for the bark for which they gave $3,000. His claim, therefore, against the insurers was that his property was a total loss. They refused to pay for several reasons, but they did not assert that the owners were in any way connected with the scuttling, or were cognizant of their captain's criminal intent. In two actions before the Nova Scotia courts, the managing owner secured judgment in his favor, but on appeal the supreme court reversed the decisions, one judge alone dissenting. Thereupon the case was taken to the judicial committee of the privy council, in England, according to the Canadian law, which upset the decisions of the supreme court of Nova Scotia. As a result, the underwriters had to pay not only the amount of the insurance, but in addition the heavy costs that had accrued.

While wooden ships are, as a rule, chosen by those desirous of defrauding underwriters by scuttling, yet iron or steel vessels are not altogether free from their attentions. In 1882, the Falls of Afton, a new British ship, left Scotland for Calcutta, India, with a valuable cargo of iron, railroad ties and coal. All went well till news reached her owners that their fine vessel of nearly 2,000 tons register had been picked up derelict in the North Atlantic and taken to Maderia by a French ship. She was found drifting around without anyone aboard, and the fate of her crew remained undetermined for some days. They had sought safety in a passing vessel and reached home in due course. As is usual in such cases, the British government ordered an investigation to ascertain the cause of the abandonment of such a well-built vessel in the summer and during fine weather. The court cancelled the captain's certificate because he had allowed the sluice in the collision bulkhead to remain open, had cut a suction pipe in the after end of the ship, and had turned the water into the hold, in order to scuttle her. As he was not proved to be in collusion with anybody to defraud the underwriters, and as no sane person would have acted as he did, the court appears to have believed that he was not responsible for his actions.

A still more recent case of scuttling was carried out on a Scotch ship. A Dundee owner of the name of Hobbs tried to beat the record in robbing the underwriters. In the summer of 1891, a small vessel named the Da Capo, of 160 tons, belonging to Hobbs, was lost about 25 miles from Montrose. Three days before Christmas of the same year, another small craft, the Greetjelina, also owned by Hobbs, met a like fate not far from the place where the waters rolled over the Da Capo. One other ship belonging to this same merchant reached his favorite dumping ground in the vicinity of Montrose, and also went to the bottom. Then the underwriters became suspicious, and careful inquiries were made as to the character of the trade that caused so many well-insured ships and cargoes to be sacrificed. They found that Mr. Hobbs was in the habit of buying worn-out vessels of considerable age, patching them up temporarily, sending them to sea well insured, and inducing his employees to scuttle them. No doubt the profits were large, but the peculiar nature of the business involved considerable risk. Hobbs and a confederate were tried and convicted, and were sentenced to a long term of imprisonment.

In September, 1894, the master of an English trawler was charged with having "unlawfully and maliciously cast away his ship." She left port on Aug. 24 and two days later water was discovered in her hold. The men went to the pumps, and one who had been below testified that he learned that the cause of the leak was two augur holes, near which he found an augur, as well as signs that it had been used not long before. The vessel was a new one, the weather was fine, the sea calm—and yet the trawler went to the bottom. Her master was tried and convicted.

The latest case of scuttling that I find on record occurred in 1895. The captain of the schooner Mary Washington was charged at Seattle with having scuttled his ship with the object of obtaining $2,500, the amount of insurance upon a cargo worth half that sum. After the ship had been taken to sea, a number of holes were bored below the water line in her hull, and upon removing a board temporarily fastened over the holes, the vessel foundered at the will of her captain, who eventually confessed. Underwriters are necessarily long-suffering, for competition among them is so keen that they sometimes prefer to pay when in doubt as to the honesty of the insurer, rather than that their action be misconstrued and business driven away. The system of ship insurance is by no means free from imperfections, and it occasionaly verges upon gambling. A few of the great ship owners insure their own ships; others do so to a specified percentage of their value.

SCARCITY OF LINE OFFICERS.

THE ANNUAL REPORT OF REAR ADMIRAL CROWNINSHIELD, CHIEF OF THE BUREAU OF NAVIGATION, IS A STARTLING DOCUMENT.

In his annual report, just made public, Rear Admiral Crowninshield, chief of the bureau of navigation, declares that the time has come, when in the interest of the health of the sailors, of their correct drilling, of their comfort, and of economy, the United States navy should follow the example of every first-class navy and provide barracks in place of receiving ships. It is figured that the government would save annually by this course nearly $150,000, or the interest on twice the sum required to provide barracks for 6,000 men. It is recommended that congress appropriate for such barracks at New York, $800,000, and for League island and Mare island $400,000 each. He calls attention in striking language to the deplorable scarcity of line officers for the manning of naval vessels now in the service. He says:

"The ever-increasing need of line officers has made itself felt with augmented force during the past fiscal year. At no time in the history of the navy has such a condition held as now exists. If the department were suddenly called upon to man for war service all the vessels available in the navy yards, it would be confronted with a requirement impossible to meet. It is a fact that there are not enough line officers of the navy to man the vessels already constructed. This being the case, the bureau need scarcely call atention to the state of affairs which will exist in about three years, when the vessels now under construction will be completed. In order to make plain the need for officers, the subject must be approached in a logical manner, and to do this we must consider the needs of each ship constructed and under construction. Taking, then, the sum of the needs of the individual ships, we reach the needs of the service, considering incidentally the need for a reserve and other reasons which will prevent the total number of officers on the list from actually serving on board ship in time of war."

To this end it is submitted that each battleship should have a minimum of seventeen line officers, and it is shown that this number is small compared with England, which has thirty-three, France twenty-six, and Germany twenty. Estimates are submitted for 268 officers for the vessels which have been commissioned, but which are now out of commission for repairs or in reserve; and 558 officers of vessels now under construction, but which will be completed by July 1, 1904, making a total of 826 officers, including a 25 per cent. reserve. These estimates do not include officers to man auxiliary vessels, such as scouts, colliers, supply ships, auxiliary gun boats, etc. Allowing that 200 officers are necessary for such ships, it is explained that 1,026 men should be provided to send the United States navy to sea. Attention is called to the status of legislation which provides line officers for the navy, and it is pointed out that under existing law there will be an increase of only thirty officers by July 1, 1904. Admiral Crowninshield says:

"In the opinion of the bureau there is but one remedy for this error in our naval policy, and that is to increase the number of cadets at the naval academy. The new construction now under way at this station will enable the government to accommodate at one time about 800 cadets, and the bureau believes that the number of cadets at the naval academy should number not less than 800. It is believed that it was the intention of congress, when authorizing quarters for such a number of cadets, that upon the completion of the works the money expended should not remain idle, but that all cadets which the institution could accommodate were to be educated; and the bureau believes that the time has come when the intended increase should begin."

He recommends that the grade of vice-admiral should be re-established permanently, remarking: "If the United States had been represented by a vice-admiral in Chinese waters during the summer of 1900, his position in the council of allied commanders-in-chief would have been of far greater dignity and weight, and one which would have been much more commensurate with the power and interests of this government. This country is often placed in a humiliating position on important occasions abroad by reason of the low rank of its naval representatives. Officers take precedence according to rank, and thus our representatives are frequently preceded by those of countries far inferior in power and prestige."

Admiral Crowninshield says that "the grave error of failing to provide a sufficient personnel, which has crept into our naval policy, can in some measure be met by the establishment of a suitable naval reserve, and the bureau recommends that the department ask congress at the earliest opportunity to provide for a national naval reserve."

The report presents some interesting statistics regarding the enlisted force of the navy, showing 38,998 applications for enlistment. Of this number 11,464 were rejected for physical disabilities, 16,723 for other causes, and there was a total acceptance of 9,896, of which 1,781 were apprentices. At the end of the fiscal year there were 18,825 enlisted men in the service, including 4,788 petty officers. Of the petty officers 2,819 were native born, 1,519 naturalized citizens and thirteen were foreigners. Of the men all but 199 were either of native birth or naturalized citizens, and those were apprentices. There were 3,158 desertions during the year. The number of landsmen under training was 3,141. In concluding the subject of the enlisted force Admiral Crowinshield says:

"It should be borne in mind that the United States possesses no adequate merchant marine from which to draw its seamen, and even if we did possess a large merchant marine the class of men it could supply would not meet the requirements of modern men-of-war. Men supplied from a merchant marine, while possessing fair qualification for seamen, must still be specially and thoroughly trained to be of use in a modern ship of war. To the merest tyro in the requirements of the personnel of a modern ship of war it must be apparent that it is no longer possible to improvise or suddenly create on short notice the class of men desired, for the reason that one, two or even three years must be spent to properly train our modern man-of-war's men. This work must be done in time of peace if we are to be at all prepared when war comes; in other words, if we are to have a properly manned navy in time of war we must prepare it in time of peace. To effect this training the bureau should have the necessary means, namely, suitable ships to properly train the enlisted personnel of the navy, and the training ships where the men can be assembled and prepared by the preliminary instructions and discipline for the fuller training carried out on seagoing ships. The system adopted two years ago of enlisting young landsmen and training them for seamen is giving good results, notwithstanding the fact that the bureau has not had as suitable ships as should be provided, and the demands of the service have not permitted keeping the men under training under as long a time as was desirable. Up to the present time these newly-enlisted landsmen have been assembled on board our receiving ships, which do not possess proper facilities for giving them the preliminary training they should receive. With suitable barracks larger numbers can be properly housed, the young recruits can be kept there for a period of six or eight months, all of this time being drilled, instructed and disciplined, and their health cared for infinitely better than if housed in old, unsanitary hulks, all preliminary to the sea-going instructions afloat. An opportunity will also be afforded of weeding out those who are unsatisfactory, thus avoiding much expense and wasted instruction. Any system looking to the development of our navy should avoid the error of not having the personnel keep pace with the material. If we are adding to the navy each year new ships and new guns, all of the most modern type, we should certainly not fail to provide also the trained officers and men with which they must be manned. The fact should not be lost sight of that it requires a much longer time to produce a naval officer than it does to produce a battleship. It is recommended that legislation be enacted providing that the quota of enlisted men and apprentices shall be as follows: Twenty-five thousand men and 2,500 apprentices under training at the training stations and on board training ships. This is an increase of 3,000 men whose training should be begun and pursued during the coming year."

PERSONAL.

Mr. B. Crowell, of the firm of Crowell & Peck, mining engineers, of Cleveland, is examining various mining properties in Ontario, Canada, for eastern capitalists.

F. E. Bachman, general superintendent of the Buffalo Union Furnace Co., Buffalo, N. Y., has tendered his resignation taking effect on the appointment of his successor.

Mr. Irving A. Burdick has sold out his interest in the Naval Electric Co., No. 97 Liberty street, New York, to his partner, Francis G. Hall, Jr., who will hereafter carry on the business at same address.

Mr. J. I. Lyle, M. E., who has been connected with the home office of the Buffalo Forge Co., Buffalo, N. Y., for the past five years, is now manager of the New York branch, Nos. 39-41 Cortlandt street.

At a recent meeting of the board of directors of the Hudson River Day Line of New York, Mr. Eben E. Olcott was elected acting president in place of Alfred Van Santvoord, deceased, who had occupied the presidency since the formation of the company.

Friends of Mr. Edwin S. Mills, assistant general manager of the Pittsburg Steamship Co., who has been seriously ill for some time past, and who underwent an operation a few days ago, will be pleased to learn that his recovery is now confidently expected.

Mr. Douglass F. O'Brien, Jr., until recently connected with the American Linde Refrigeration Co., New York, has severed his connection with that company and has opened an office at No. 45 Broadway. Mr. O'Brien will continue in the refrigerating machinery business.

Mr. John Haug of No. 206 Walnut place, Philadelphia, announces that at the end of the present year he will retire from the position of ship and engineer surveyor to Lloyd's Register of Shipping at Philadelphia, which place he has held for over twenty years, and will devote all his time to the practice of naval architect, consulting engineer and surveyor.

Prof. R. A. Smart has resigned his position in the department of experimental engineering of Purdue University at LaFayette, Ind., and connected himself with the B. F. Sturtevant Co. of Boston, Mass., with whom he will become the head of a department of experimental engineering which is being established for the purpose of investigating all problems relating to blower practice and of developing new and more efficient applications of the fan blower in all lines of industry.

GOLD MEDAL FOR STEAM TOWING MACHINE.

The announcement from Buffalo that the Shaw & Spiegle patent automatic steam towing machine, manufactured by the American Ship Windlass Co. of Providence, R. I., had been awarded the gold medal at the Pan-American exposition was not surprising, in view of the part that it has taken in developing the practice of steamers towing immense barges, and thus moving freight in great quantities on minimum of steam power requirement and very low fuel expenditure. The development of this machine on steel barges of as much as 8,000 tons capacity on the great lakes has attracted attention all over the world and has resulted in the sale of it in several European shipping districts where the tow-barge methods may be applied as they have been in this country on the lakes and on the Atlantic seaboard. The manufacturers now have negotiations under way that will result in several of the machines going into Great Britain and Germany during the coming year. No project of the tow-barge kind will be undertaken in the future without the use of this machine, as the towing of big barges is impossible without it. It is now as much a part of the specifications for such vessels on the great lakes as a windlass or capstan, and the Providence company takes special pride in its workmanship, resulting in entire satisfaction with every machine turned out.

The American Ship Windlass Co. also secured at the Pan-American exposition a silver medal for their steam winch. The Providence works is as usual full of business. In addition to numerous outfits of windlasses, capstans, etc., furnished during the past year to the American Ship Building Company, which has been at work on scores of big freighters for the lake trade, they have still in hand orders for nine such outfits from the American company.

The steamer Springfield, building by the Pusey & Jones Co., Wilmington, Del., for the Bordentown & Philadelphia Transportation Co., was launched this week. The vessel is 135 ft. long, 28 ft. beam and 9 ft. deep.

STEEL CORPORATION'S STATEMENT ANALYZED.

The New York Evening Post publishes the following analysis of the quarterly statement of the United States Steel Corporation:

"Now that a suitable length of time has passed in which to analyze thoroughly the remarkable statement issued by the United States Steel Corporation, it is better understood how the figures are as represented. In Pittsburg well-posted steel men are of the opinion that the $7,059,000 checked off for depreciation and for sinking fund is not enough, but that these two items were sacrificed in order to make a better showing, especially during the strike months. If this was done, they argue that a mistake was made, since the public expected a drop in earnings during the strike months, and if one had been shown no bad results would have followed, even in the stock market, as the strike had ended before the statement was issued. What division was made as between surplus and sinking-fund, in this seven-million item, is not made known. If it were half and half, the feeling is that both would be too low. More than $3,500,000 should be set aside for a half-year's contribution to the sinking fund, and depreciation in plants, etc., would more than equal the same amount in a concern of the magnitude of the United States Steel Corporation. Depreciation in ore and coke and coal fields alone is estimated to be nearly equal to that amount, to allow for future exhaustion. In that case, however, the higher value of the sources because of their growing scarcity may have been charged up against the loss experienced by mining and use.

"During the summer, repairs in the various plants of the Steel Corporation were not carried on with the energy that characterized the season when mills were closed under the old competitive regime. Necessary repairs were made, it is true. They consisted of repairing machinery that would not run without overhauling, and rebuilding blast furnaces that had burned out and had to be relined if operated, and of other similar work. But the old-time anxiety to improve and keep in the forepart of the procession was not apparent. Such improvements as the rebuilding of the old Carrie blast furnaces and two new ones and the Duquesne merchant mills were carried on, and new tin-plate works were undertaken at Chester, W. Va.; but these projects had their conception before the steel trust was formed. Little more was done, because it was not absolutely necessary. The plants for the most part, however, are in fine condition. Those that are not will be operated only in periods of abnormal activity as at present. The saving in this item alone will amount to millions over expenditures of previous years, and added vastly to the showing.

"That the strike did not affect the earnings of July and August is partly because the general strike did not begin until late in the month of July. Only a few union mills were closed before that, and from them shipments were being made of material that had been finished before July 1. The great 'profit-stopper' was the strike in the tin-plate mills; but as it takes over two weeks for the tin housemen to finish what the Amalgamated men make in the hot mills, even that did not become apparent until August. A more important feature, and one that has been entirely overlooked, came in at that time—August—to prevent a bad showing. This was the absorption of the Shelby Steel Tube Co. This concern was absorbed during that month, and its great earnings were at once shown in the revenues of the Steel Corporation, making a favorable showing in the totals, compared to other months, even when the mills of the American Tin Plate Co., American Sheet Steel Co., and the American Steel Hoop Co. were operating in full, and the Shelby mill was outside. The Shelby controls eight seamless tube plants, new and in good condition, in western Pennsylvania, Ohio and Indiana. It makes a high-class material by patented process, and its net earnings are enormous. Another pertinent reason for the showing is that while the constituent companies of the United States Steel Corporation made no changes in prices of the products affected by the strike, some changes had been made before. Among these were advances in steel plates and various forms of puddled iron. These advances were so pronounced that the members of the Amalgamated Association employed in the mills of the Republic Iron & Steel Co. were given a 10 per cent. advance under their sliding scale, which is adjusted bi-monthly. Prices on steel bars were advanced in September. Additional contracts for armor plate were taken early in the spring, and the consolidation of operating departments of various companies in steel, ore and coke had given a saving which formerly went into salaries. When the advances were made, there were, of course, contracts at old prices on the books of the steel companies. By July these had been largely worked off, and the higher priced orders were being filled, thus adding a higher ratio of profit during July, August and September in non-union mills, helping to overbalance the strike account. On the present basis of steel consumption and a rising standard of prices, the earnings will show an increase, next quarter especially, as modern methods are being introduced in the tin plate mills. It is regarded as certain, however, that production and consumption are at present more than ordinary, and that a reaction with lessened demand, lower prices, smaller operations and low earnings is only a question of months."

MODERN SEAMANSHIP.

"Modern Seamanship" by Lieut. Com'dr Austen M. Knight has attracted unusual attention for a technical volume. It has been most flatteringly received everywhere and a chorus of praise has been bestowed upon it. In the last forty years seamanship has lost its commanding position as an art, owing to the change from sail to steam and the substitution of metal for hemp in the rigging of vessels. It has become subordinate to the science of navigation. During the period of transition from sail to steam, a period of rapid and marvelous changes, the text books on the subject of seamanship have become obsolete, and Lieut. Com'dr Knight's book, therefore, occupies a distinctly fresh field. We have rarely seen a large book so well printed and well illustrated. As an evidence of the avidity with which it was seized upon by those who needed a work of this character it is only necessary to state that the second edition was printed four months after the first. It is a splendid work upon seamanship. No work of its kind has been better advertised, for even the leading daily newspapers devoted columns to it. The author has just been selected as executive officer of the Olympia. The work may be had from the Marine Review.

SUMMARY OF NAVAL CONSTRUCTION.

The monthly summary of construction issued by the naval board of construction reveals a fair degree of progress in the building of the new navy. Work has not been started as yet upon the protected cruisers, though some of the new armored cruisers and battleships have been laid down. Following is the summary:

BATTLESHIPS. Name.	Building at	Degree of completion, Per cent. Sept. 1.	Oct. 1.
Maine	Cramp & Sons	64	67
Missouri	Newport News	44	45
Ohio	Union Iron Works	43	43
Virginia	Newport News	0	0
Nebraska	Moran Bros. Co.	0	0
Georgia	Bath Iron Works	1	1
New Jersey	Fore River Co.	0	0
Rhode Island	Fore River Co.	0	0
ARMORED CRUISERS.			
Pennsylvania	Cramp & Sons	2	4
West Virginia	Newport News	0	1
California	Union Iron Works	0	0
Colorado	Cramp & Sons	5	7
Maryland	Newport News	0	1
South Dakota	Union Iron Works	0	0
SHEATHED PROTECTED CRUISERS.			
Denver	Neafie & Levy	55	57
Des Moines	Fore River Engine Co.	50	54
Chattanooga	Lewis Nixon	45	46
Galveston	Wm. R. Trigg Co.	36	40
Tacoma	Union Iron Works	20	20
Cleveland	Bath Iron Works	64	67
St. Louis	Neafie & Levy	0	0
Milwaukee	Union Iron Works	0	0
Charleston	Newport News	0	0
MONITORS.			
Arkansas	Newport News	66	71
Nevada	Bath Iron Works	91	91
Florida	Lewis Nixon	70	71
Wyoming	Union Iron Works	75	75
TORPEDO BOAT DESTROYERS.			
Bainbridge	Neafie & Levy	98	99
Barry	Neafie & Levy	90	91
Chauncey	Neafie & Levy	90	93
Dale	Wm. R. Trigg Co.	97	97
Decatur	Wm. R. Trigg Co.	98	98
Hopkins	Harlan & Hollingsworth	76	76
Hull	Harlan & Hollingsworth	75	75
Lawrence	Fore River Engine Co.	99	99
MacDonough	Fore River Engine Co.	98	98
Paul Jones	Union Iron Works	85	85
Perry	Union Iron Works	89	89
Preble	Union Iron Works	87	87
Stewart	Gas Engine & Power Co.	55	62
Truxton	Maryland Steel Co.	72	76
Whipple	Maryland Steel Co.	71	75
Worden	Maryland Steel Co.	71	75
TORPEDO BOATS.			
Stringham	Harlan & Hollingsworth	98	98
Goldsborough	Wolff & Zwicker	95	95
Blakely	Geo. Lawley & Son	98	98
DeLong	Geo. Lawley & Son	98	98
Nicholson	Lewis Nixon	92	95
O'Brien	Lewis Nixon	98	98
Thornton	Wm. R. Trigg Co.	97	97
Tingey	Columbian Iron Works	68	69
Wilkes	Gas Engine & Power Co.	85	87
SUBMARINE TORPEDO BOATS.			
Plunger	Lewis Nixon	25	35
Adder	Lewis Nixon	85	90
Grampus	Union Iron Works	51	51
Moccasin	Lewis Nixon	80	82
Pike	Union Iron Works	50	50
Porpoise	Lewis Nixon	70	78
Shark	Lewis Nixon	68	72

GREAT LAKES REGISTER.

Not a great deal of thought is required to understand how slow must be the work, even under the most favorable conditions, of building up an organization for the classification of vessels. When the first book published by the Great Lakes Register was issued a few years ago under the direction of Capt. F. D. Herriman, who is still in charge of the register in Cleveland, its special merits even in comparison with the books of Lloyds and the Bureau Veritas, were recognized, but it was the opinion in some quarters that the cost of the work, in view of the labor involved in trying to make it the one register of lake shipping, would prove too great to warrant continuance through several years of the slow advancement that always attends such undertakings. But the work has been kept up with steady improvement and enlargement of its scope and it has been entirely divorced from the influence of either underwriter, ship builder or ship owner. There are now building under supervision of the Great Lakes Register the following vessels:

Type of vessel.	Where building.	For whom building.
Passenger steamer	Collingwood, Ont.	Northern Nav. Co.
Towbarge	Collingwood, Ont.	F. H. Clergue.
Freight steamer	Cleveland, O.	American Nav. Co.
Freight steamer	Cleveland, O.	American Nav. Co.
Freight steamer	Cleveland, O.	W. C. Richardson.
Freight steamer	Lorain, O.	W. H. Mack.
Freight steamer	Chicago, Ill	E. D. Carter-W. W. Brown.
Freight steamer	Chicago, Ill	W. W. Brown.
Freight steamer	Buffalo, N. Y.	W. W. Brown.
Freight steamer	Port Huron, Mich.	Minch estate.
Freight steamer	Port Huron, Mich.	Jenks Ship Building Co.
Passenger steamer	Detroit, Mich.	Detroit & Buffalo Transit Co.
Passenger steamer	Detroit, Mich.	Detroit & Buffalo Transit Co.
Passenger steamer	Detroit, Mich.	B. W. Parker.
Freight steamer	Superior, Wis.	G. A. Tomlinson.
Freight steamer	Superior, Wis.	G. A. Tomlinson.
Freight steamer	Toledo, O.	Pacific coast parties.
Freight steamer	Toledo, O.	Not yet announced.

WIRELESS TELEGRAPHY.

A SUMMARY OF PROGRESS MADE BY THE VARIOUS NATIONS DURING THE PAST YEAR.

A very fair idea of what the nations are doing with wireless telegraphy may be gathered from the pages of the Naval Annual, just issued by the Naval Intelligence office at Washington. This subject was assigned to Lieut. L. R. De Steiguer, who contributed the following review:

"During the early development of wireless telegraphy it was soon realized that its use would be largely for maritime and military purposes. The electrical engineers and experts then proceeded with this idea in view and have perfected their instruments for communication between ships, between ships and light-houses and stations on shore, and between islands where the laying of a cable is a difficult operation. It is of especial interest to naval officers, owing to the success with which long-distance communication has been maintained over the water, its great possibilities for navigating purposes, and for use on scouting vessels, and its independence of weather, fog, snow, rain, or darkness. Great progress has been made during the last year, mainly in the following points: First, tuned and multiplex wireless telegraphy; second, increased distance over which messages can be transmitted.

"One of the greatest disadvantages for naval purposes has been that privacy of messages could not be secured, and in the fact that messages could be rendered unintelligible by working another transmitter within the field of the waves. Mr. Marconi claims to have succeeded in tuning his receiving instruments so that they respond only to tuned transmitters. To prove the success of his system, two messages were sent from St. Catherine Point, one in English and one in French. The receivers at Poole were connected to the same air wire, about 40 ft. in length, and each rolled out the message on its tape, that in English on one and that in French on the other. While these experiments were being carried out, others for the British admiralty were taking place between Portsmouth and Portland. These lines of communication intersected each other, but no interference or confusion of messages resulted.

"When the German squadron, after its trip out to China, arrived off one of the ports the British admiral there sent a wireless message for a boarding officer to visit the German flagship and offer the usual civilities. Upon the boarding officer's arrival he was informed by the German officers that the message had been read. On another occasion the officers of an English ship were surprised, while experimenting in the Mediterannean, to receive a message in Italian asking as to the position of the ship. This message came from an Italian man-of-war, and its receipt and the interception of the message mentioned above show the importance of tuned instruments for naval purposes. All of these ships were supplied with the older form of wireless apparatus and were unable to preserve secrecy.

"Prof. Slaby has also presented a method of solving the problem of multiplex and syntonic wireless telegraphy. From the transmitting station he sends out waves of a certain length and arranges the receiving station to respond to waves of these lengths. The receiving wire is made the length of a fourth of a wave length, or an uneven multiple thereof, so that waves of any other length arriving will not affect the receiver, but will be sifted out and travel to earth. By connecting spools of wire to the receiving wire so as to increase the length in multiples of the wave length, as indicated above, it is possible to arrange a station to receive messages from different transmitting stations with the same air wire and with the messages coming from the different stations at the same time. This method would allow the navy, merchant marine, and the different departments of the government to have a common system, while any one of these obtains a system of its own by connecting spools of wire to the receiving air wires and thus preserves secrecy in all its communications. Prof. Slaby has described his system in a lecture, a translation of which is appended.

"During the last year the North German Lloyd Co. reported to the German nautical society that the captain of the Kaiser Wilhelm der Grosse succeeded in communicating with the island of Borkum at a distance of 29 miles, and with a light-ship at a distance of 21 miles. This company, in addition to their stations and ships fitted with the Marconi system, has been experimenting with the Schäfer system, and maintained communication between their stations on shore and the Weser light-ship, in the outer roadstead at Bremerhaven, a distance of 32 miles. These were considered good working distances, but Mr. Marconi has recently succeeded in sending wireless messages from St. Catherine point to the Lizard, a distance of nearly 200 miles. He has installed an outfit on board the Nantucket light-ship which should be of great benefit to the navy and merchant marine. Ships arriving can establish communication with New York from twelve to fourteen hours before their arrival, and at a distance of over 200 miles. At the request of steamship lines, the English board of trade has instructed the Marconi company to erect a station on the mainland close to the Fastnet Rock, at the western end of Ireland, for the purpose of reporting the arrival of steamers. Vessels and stations fitted with wireless apparatus have at times rendered great service by sending assistance to ships and people in distress along the coasts. The channel steamer Princess Clementine, plying between Dover and Ostend, fitted with Marconi apparatus, has been able, in all kinds of weather, to keep in constant communication with both places on her trips across. Upon one trip, when passing the light-ship, stationed 25 miles off Dunkirk, it was learned that she would be unable to show a light that night unless prompt assistance was sent. The captain sent a message to La Panne, whence it was forwarded to Dunkirk by the regular telegraph line, and a tug was sent to make the necessary repairs. On another occasion this vessel passed a ship wrecked on a bank; she established communication with Ostend, and was able to inform the crew before leaving that assistance was on the way. Experimental stations have been erected on the coast in England to warn vessels, fitted with apparatus, of their approach to dangerous points. The bell connected to the receiving instrument begins to ring when a vessel enters the zone of influence of the shore station, and continues to ring until she passes out of this zone. At the same time she receives the name of the point upon her tape and can establish regular communication with the shore station if she so desires.

"It is reported that Chile has made contracts to have stations installed on the Marconi system, reserving the right to terminate the concessions upon six months' notice. By these stations it is the intention to connect Punta Arenas and Ancud or Puerto Montt.

"In Denmark experiments with wireless telegraphy are reported to have been made at Oresund. The distance over which messages were sent was 19.88 miles.

"During the last year thirty-six ships of the British navy have been equipped with the Marconi apparatus, and ten or twelve more have Capt. Jackson's outfits on board. The signal stations at Dover, Culver Cliff, Bill of Portland, Roches Point, Rame Head, Scilly islands, Gibraltar and Malta have been equipped or are being equipped with Marconi outfits. The station at Culver Cliff will be placed in communication with the commander-in-chief's office at Portsmouth, and that at Rame Head in touch with the commander-in-chief at Devonport. The principal vessels of the channel, Mediterranean and China fleets are now equipped with and using the Marconi system. Good results seem to have been obtained by the vessels of these fleets. Communication has been maintained in many instances over 50 miles, and lately distances of about 100 miles are reported to have been covered. The Hector, station ship at Portsmouth, exchanged signals with the Majestic, flagship of the channel squadron, at a distance of 103 miles, and it was thought this distance would have been exceeded if a ship at Portsmouth had not interrupted communication. The Mediterranean fleet has been carrying out experiments in long-distance signaling and the Tyne, storeship, is reported to have communicated with headquarters at Malta from Cape Passaro, Sicily, a distance of about 70 miles. Frequently trouble has arisen from atmospheric electricity and from the fact that several vessels have been working their transmitters at the same time, where the waves have interfered with each other, which has rendered the messages unintelligible. When the Ophir was conveying the duke of Cornwall and York through the Mediterranean, the fleet made an effort to keep the Ophir in communication with Gibraltar and Malta and to connect with Crete in passing after leaving Malta. The reports coming from the use of wireless telegraphy by the vessels accompanying the Ophir were that communication was lost at times and sometimes was only partial, while messages were mixed and rendered unintelligible when more than one transmitter was worked at a time. The admiralty has now ordered that wireless outfits be placed on board all battleships and cruisers attached to home ports and the Mediterranean fleet and on all vessels fitted out for the reserve, training and channel squadrons. As the admiralty has the use of Marconi's improvements, all vessels will probably be fitted with tuned instruments.

"In France the Popoff-Ducretet apparatus has been used on board ships of the Mediterranean and northern squadrons and at light-houses. Communication has been successfully maintained between ships and between ships and light-houses over distances of 45 to 50 miles. Lieut. Tissot and M. Rochefort have made great progress in developing wireless telegraphy for use in the navy and have made many improvements in the apparatus.

"The Slaby-Arco system has been adopted for the German navy. Prof. Slaby has worked with the object of giving the navy an efficient and reliable system, and a less expensive one than the Marconi. The results of his experiments have been very interesting and very successful in solving the question of syntonic and multiplex telegraphy. Some of the vessels have already been supplied with outfits. Light-houses have also been equipped and shore stations installed, which have been found very useful for pilots and for navigation.

"In addition to experiments carried on by Mr. Marconi on board ships, the Italian government has been investigating the project of connecting its outlying islands with the mainland by wireless telegraphy, with the object of substituting this system for submarine cables.

"Japan has ordered outfits for some of her men-of-war, and has also been carrying on experiments on shore for its use in the army. She recently ordered very powerful induction coils in New York for two of her ships, with which she expected to obtain very good results in long-distance signaling.

"Russia has been very active in carrying on experiments in wireless telegraphy and in equipping her ships and stations on shore. In November of last year it was reported that 200 complete Popoff instruments had been sent to Vladivostock and Port Arthur, for use at these two harbors, stations along the Korean coast, and for the vessels in Chinese waters. Mr. Popoff has been very successful in the development of the coherer, and his system has been adopted for government service. When the General Admiral Apraxine was ashore on the coast of the island of Hohland, in the Gulf of Finland, Mr. Popoff was intrusted with the work of installing two wireless telegraphy stations, one on the island of Hohland and one upon one of the islands in the neighborhood of Kotka, 29 miles distant. It was very important for the work of salvage to keep communication between the ship, the mainland, and the ice breaker Ermack. The above stations were completed in January and were continued in use until April, when the ship was saved. During a period of eighty-four days 440 telegrams were exchanged; the longest consisted of 108 words. The masts were 157 ft. in height and that at Kotka was in the midst of a wood. The temperature ranged from 10° F. to —4° F. During snowstorms and in all kinds of weather regular communication was maintained, with the exception of two days, when some of the apparatus had been carried away. Soon after these stations had been erected twenty-seven fishermen were carried off on an ice flow. A message to this effect was transmitted from Hohland and was received by the Ermack in time to rescue them. One of the Russian infantry regiments experimented with the Popoff system during field maneuvers and obtained very good results. The great drawback experienced in this case was the weight of apparatus, but it was thought possible to make great improvements by using lighter materials.

"Wireless telegraphy has been receiving some attention in Spain. Experiments are being carried on with a system invented by Col. Cervera of the Spanish engineers, with the object of connecting her African possessions and the Balearic islands with the mainland.

"Experiments were also made last summer and fall in the Stockholm archipelago between launches and stations on shore. The height of the receiving wire on the launches could not be made more than 78.74 ft., but, notwithstanding this short length, messages were sent 18.64 miles, with a voltage of 16 in the primary of the induction coil, and with islands intervening. A Siemens & Halske apparatus was used, the coherer differing somewhat from that previously used, inasmuch as the tube inclosing the metal filings was made of ebony in place of glass, besides which the

distance between the pole pieces could be regulated by means of a screw. According to later reports the Swedish admiralty has contracted for four outfits for shore stations and for apparatus for several vessels of the navy on the Slaby-Arco system."

ARMAMENT FOR THE NEW BATTLESHIPS.

If Secretary Long adopts the view expressed by the majority of the officers whose advice he has sought, the projected battleships of the navy will be greatly superior in offensive power to any vessel of their type under construction or planned by foreign service. The design, which will be submitted to the secretary for submission to congress, will provide for a battery consisting of four 12-in. guns in two turrets, forward and aft, eight 8-in. guns in four waist turrets, and twelve 7-in. in broadside. Fifty-six communications have been received by the navy department from officers describing their views upon the plans for the projected battleships prepared by the majority and minority of the board of construction. Thirty-three officers recommended the adoption of the minority or superposed turret design and the remainder prefer in its stead the majority plan. The remarkable feature of most of the communications is the expression of regret at the proposal of the majority of the board to abandon the 8-in. gun. Admiral Dewey is one of the officers who deprecate the suggestion of the majority to substitute the new 7-in. for the 8-in. gun, and he has strongly advised that this be not done. The plan submitted by the majority provides for the construction of a battleship which shall carry four 12-in. guns, in two turrets, forward and aft; twenty 7-in. guns, in broadside, ten on each side, and twenty 3-in. guns. The minority plan contemplates a battleship identical in all respects with that of the majority, save in the matter of armament. The main battery it proposes includes four 12-in. guns, in two turrets, forward and aft, four 8-in. guns in two turrets, superposed on the 12-in. turrets, eight 8-in. guns, installed in four waist turrets, two on each side, twelve 6-in. guns in broadside, six on each side, and eight 3-in. guns.

These plans were adopted by the majority and minority after careful consideration of seven different designs. The first of these designs, which was prepared by Rear Admiral Bowles, chief constructor, and which received the approval of Admiral Dewey, provides for a ship which shall carry four 12-in. guns, in two turrets, forward and aft, sixteen 8-in. guns in broadside, eight on each side, and twenty-six 3-in. guns. Another design submitted to the board by Rear Admiral Bowles is interesting only because it presents a novel arrangement of turrets, and enables an excellent distribution of weights. The chief constructor termed this design "the hen and chicken scheme," because of the way turrets are grouped. The 12-in turret at each end of the ship was practically surrounded by four smaller turrets, accommodating eight 8-in. guns. The sides of the vessel fairly bristled with guns of the secondary battery. The great advantage of the "hen-and-chicken" arrangement lay in the removal of the magazines from the machinery section of the ship, but this was counterbalanced by the serious disadvantage which existed in the grouping of the turrets and the increased target thus furnished an enemy.

The majority of the board on construction adopted the design contemplating a broadside battery of 7-in. guns, because it desired to reduce the number of turrets. It claims that during the Spanish-American war there was a general condemnation of turrets as being detrimental to efficient gun service, and in view of this feeling it decided that there should be no turrets for guns of less than 12 in. It rejected the design contemplating 8-in. guns in broadside upon the advice of Rear Admiral O'Neil, chief of ordnance, who stated that 8-in. guns were too long and heavy for use outside of a turret. Rear Admiral Bowles is confident, on the other hand, that an effective distribution of 8-in. guns in broadside can be made, and Admiral Dewey holds the same view. The admiral's objection to turrets is the result of his experience during the battle of Manila bay. The bridge of the Olympia, his flagship, was directly over the forward 8-in. turret, and the difficulty of aiming the turret guns and the slow rate of fire maintained were responsible for his opinion that guns in broadside are far more effective than those enclosed in turrets. In his letter to the secretary of the navy setting forth his views upon the majority and minority plans, the admiral stated that he entertained these objections to turrets:

(1.) The turret must be brought back to its train on the object after each discharge of each gun.

(2.) The limitations of the sighting hood interfere largely with accuracy and quickness of aim.

(3.) The fact that all guns (whether two or four) being pointed by the same individual, the element of personal error of one man, whether due to lack of skill, nervousness, or temporary physical condition, thereby enters too disproportionately into the effective power of the ship's battery.

Naval ordnance experts, who advocate the superposed turret, say that Rear Admiral R. B. Bradford, chief of the bureau of equipment, and the most ardent supporter of this type, will have no difficulty in answering Admiral Dewey's objections. The turrets of the Olympia during the war with Spain were of a type obsolete today, and as Admiral Dewey stated, it was necessary to bring them back to their train on the object after each discharge. This is not now the case. The guns of a turret are loaded in any position, in fact are loaded while trained on the target. Improvements in the sighting hood have also removed the most important of the limitations which came under Admiral Dewey's observation. The third objection is the most difficult to meet because it involves the personality of the gun pointer. Every effort is made to select only the most careful and the coolest men for this responsible duty, and it is argued that there is a chance of greater accuracy on the part of one man who is an expert in aiming guns in turrets than on the part of sixteen men pointing sixteen guns, some of whom undoubtedly would be less skilful than their comrades.

The admiral's advocy of 8-in. guns is extremely gratifying to most officers of the service who have been consulted by the department. Rear Admiral O'Neil claims that the 7-in. gun far exceeds the 8-in. gun now in service in the extent of its range and the flatness of its trajectory for a given distance. It promises, he says, a more rapid rate of fire, an average of 2.5 rounds per minute, against 1.2 rounds per minute for the 8-in. gun. Rear Admiral Bradford contends that the rate of fire for 8-in. guns will be considerably increased in turrets manipulated by electricity, and he expects an average of three rounds per minute. Rear Admiral O'Neil denies this, and says that actual practice will show that while the 8-in. gun is throwing 300 lbs. of metal in one minute, the 7-in. gun will be discharging 412.5 lbs. There is an inferiority in the weight of the shell fired by the 7-in. gun, it being 175 lbs., against 250 lbs., the weight of an eight-inch projectile, but this disparity is made up, he holds, by the greater accuracy of fire, besides the 7-in. projectile can pierce armor now being fitted on foreign ships as readily as the 8-in. shell. The majority of the officers heard from by the department believe that it is wiser to be sure of an excess of power than in estimating for just enough, and while admitting that the rate of fire of the 8-in. may be less than the 7-in., they regard the former caliber as far more suitable for the main battery of a battleship.

IN THE PHILADELPHIA SHIP YARDS.

Philadelphia, Oct. 16.—The sailing of the Russian battleship Retvizan, for the Brooklyn navy yard, where her bottom is to be cleaned preparatory to her official trial trip, has been the only prominent incident in local ship building circles. There seems little doubt, judging from past performance of the vessel, that she will meet her contract requirements. It is a surprising fact that no work was found necessary on the Retvizan's engines or boilers after her builders' trial at sea. Chief Engineer Mull believes that the machinery is all down to perfect bearing and said that the engines could be driven to the limit over the course between Capes Porpoise and Ann. It will be a long and severe test of twelve hours' duration. From the data already secured it has been found that the speed of 18 knots is easily attainable with 122 revolutions. This calculation was based on the performance between northeast and southwest lightships, off the Delaware capes, when the Retvizan's bottom was very foul. Its condition deducted at least 75 knots on that occasion and there was also a very heavy cross sea running. Edwin S. Cramp firmly believes that the Retvizan will return to this port with a full 19 knots to her credit and his opinion is shared by the Russian board of inspection.

Another trial trip which is attracting considerable attention from naval officers is that of the torpedo boat boat destroyer Bainbridge. While she has never been officially tested, the Neafie & Levy Ship & Engine Building Co. has had her down the river several times, twice to the sea, and say that they have no reason to be other than pleased by her excellent showing. A few days ago the Bainbridge was put through her fastest paces between Overfalls lightship and the Brown shoal, in deep water near the Delaware capes, and it is claimed that 30 knots was attained. The trials being given the Bainbridge are largely to determine whether the experiment of changing her stern lines has been a success. This was decided upon some weeks prior to the launch of the destroyer and was effected by cutting away the stern and arching it somewhat above the propellers. Before this work was attempted a series of experiments in the model tank at Washington, in which a model of the original design of the Bainbridge and one in which the alteration had been made, were compared. It was found that the latter got rid of the water much faster. Naval Constructor J. H. Hanscom, who is on duty here in connection with the warships under construction, believes that the Bainbridge will easily be a knot faster as a result of the change. If such proves a fact the same alteration will be made in her sister ships, the Barry and Chauncey, which are held on the stocks to await the result of the tests.

The New York & Cuba Mail Steamship Co., owners of the steamship Niagara, which is receiving new boilers and a new tail shaft at Cramps' ship yard, has begun interesting admiralty proceedings in the United States district court to recover heavy damages against the Italian steamship Audace, for injuries which the Niagara received in collision with the latter. The libelant says that on the afternoon of Oct. 9, while the Niagara was moored at the ship yard, the Audace came down the river, bound on a voyage to Italy, and, by the carelessness of those in charge, was allowed to run into the Niagara, breaking six plates and causing other damage. This is said to be the first instance where a vessel has been run into at Cramps' ship yard.

The New York Ship Building Co., Camden, N. J., will have a steamship to launch in a short time. She is an 8,200-ton craft for the American-Hawaiian Steamship Co. and will be followed by another of the same size by the middle of November. The steamship M. S. Dollar, launched May 4, and the pioneer vessel of the new concern, has been altered into a tanker and is now known as J. M. Guffey. She will sail from this port in a few days to engage in the oil trade between Sabine Pass and Atlantic coast ports.

The Chilean training ship, General Boquedano, has arrived here from New York and will remain until the end of the week, when she will begin her homeward voyage to Valparaiso. Her officers and crew number 300 men, and she has in addition thirty-eight cadets, who will inspect the various ship building industries on the Delaware.

Local shipping men are pleased that a full cargo grain carrier has been engaged to load at this port for Europe. For a long time there has been a great depression in this important export. In place of the fleet of modern freight steamships which could be seen every week in the vicinity of Girard point and Port Richmond the arrivals have been limited to an occasional tramp, and even then the latter has sailed with only a part cargo of grain. The freight rate remains surprisingly low, a full cargo boat recently accepting 1s. 9d. per quarter of eight bushels to Cork for orders. In the instance of a steamship carrying 100,000 bushels this would scarcely net $6,000 for the voyage. Only two years ago the rate was 4s. 3d. for a similar voyage, and those were halcyon days for the owners of this species of craft. The port has, however, made good in the petroleum exports what it has lost in the grain. These oil shipments have been enormus of late, enough to warrant the assertion that 1901 will be the banner year in this important item.

It is a regretable fact that of the thousands of torpedo boats in service the only two to have been destroyed under peaceful conditions have been those equipped with turbine engines. It is not charged, however, that the engines were even indirectly to blame. The Viper went to pieces on a rock and the Cobra broke amidships in a heavy beam sea. The cause of the wreck of the Viper is quite clear; and that of the Cobra was undoubtedly due to lightness of construction. Everything about her was sacrificed to speed and she was never intended to be out in heavy weather.

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If we all continue to read the literature of despair wherewith the sober magazines of the day are flooded we will reach the inevitable conclusion that the world is going to the devil. What is the base of all this pessimism that fairly fouls the air we breathe? A while ago the papers were full of articles upon the decadence of the United States senate. According to the views of a considerable element in the country the supreme court has overthrown the declaration of independence. Preachers pour out the vials of their wrath upon the general corruption of morals. Mark Twain has declared that our missionaries have ceased to be Christians and is directly responsible for the amazing falling off in contributions to foreign missions during the present year. Charles Eliot Norton says that popular sentiment has gone awry and that men are emphasizing the wrong things in life. G. Stanley Hall in the current Forum finds that our school system is lacking in vital force; and others are following Macauley's ancient lead that a democracy must eventually perish. Altogether these leading lights write despair pretty thoroughly upon the face of things. It is enough to give us a national fit of blues. What is the underlying motive? It is the old, old, blind belief that the golden age is in the past. Man turns instinctly to the past for his examples. This habit of living in retrospect was old in the days of Cæsar. The good old times have always been in the generation which has just ceased to exist.

What are the facts? Mr. Gladstone said that the nineteenth century had added more to the material wealth of the world than all the centuries which had preceded it put together. The most cursory view of material achievement will prove this to be true. It is also true that the past decade has added more to the world's material wealth than has the century which preceded it. We refer to tangible assets. All the centuries of the Christian era have not contributed more to the comfort and welfare of mankind than have the years from 1890 to 1900. The wealth of the world has almost immeasurably increased. Ventures are undertaken which ten years ago would not even have been dreamed of. But the great advance has not alone been an industrial one. It has been along every avenue of science. One has only to point to the sciences of medicine and surgery to recognize the force of this. No surgeon would think of pursuing the same course of practice that he did ten years ago. But the retrospects (we will call them by no other name) claim that the doors to opportunity are closed. They have been multiplied a thousand fold. It is true that the mammoth fortunes will be fewer and fewer. They come from the control or exploitation of raw resources which are, of necessity, few in number. But the fair fortune, the fortune of comfort and plenty, is fast increasing. Notwithstanding the few glaring examples of stupendous and inordinate wealth the problem of distribution is being mastered. The golden ages of the past are merely dreams. It is better to live in a year of today than a cycle in the ages which have hallowed in our imagination. The thing to do is to face the future with confidence. The present generation has no antecedents. It is its own ancestor. It is meeting and settling problems which never confronted the world before. It is natural to suppose that it will make a few mistakes, but it will remedy them as soon as it discovers them. The trend of events is titanic and every living person is an actor in the great drama of the world's progress.

It is probable that a liberal building policy with respect to naval ships will be urged on congress at the approaching session. No authorization for new construction was given by congress at the last session, owing in part to a disagreement as to the respective merits of single or superposed turrets. Congress contented itself with a direction to the navy department to submit full plans for two battleships and two armored cruisers to it at the approaching session so that it could choose the designs. Secretary Long, however, does not regard himself as prevented from recommending the construction of additional warships, and as a full year has been lost in the execution of the naval scheme laid down by the policy board, and as more time has been lost through the great delay in construction of the ships already authorized and contracted for, a considerable increase must be recommended in order to avoid falling hopelessly behind in the erection of the ideal American navy.

The Chicago Tribune has asked itself the question, What is the best way to build up an American merchant marine? After declaring that the subsidy plan is clearly not popular with the American people, though upon what authority is not apparent, it asks what is the next best way. In an endeavor to answer that question it solicits the opinion of the editors of eighteen different papers, every mother's son of whom did not know—and, indeed, it would be very surprising if they did. Twelve of the eighteen editors declared themselves opposed to the subsidy plan, four of them favored it and two of them had no opinion. As a general rule that indeterminate mortal, the editor of a paper, is a pretty poor person to go to for advice upon industrial matters. He may spout in his paper pretty actively, but what he actually knows about the subject could be put upon a mighty small piece of note paper. He is in a calling where he is compelled to embrace all matter, but to be an authority upon none. So important a subject as the revival of the American merchant marine should be placed in special hands. Let the Tribune ask its question of those who are directly concerned in the intricacies of shipping and who have to fight with competition from day to day. The men in the business are generally honest and they will give an honest opinion.

It is most singular that the most memorable speech that the late President McKinley ever made should have been made the day before he was shot. During his whole extraordinary career no speech of his has attracted greater attention than this. Comment upon it has been widespread. English journals, in particular, have quoted from it extensively and have declared it to lift the late president into the realm of high statesmanship. Such sentences as "Isolation is no longer possible or desirable" and "We must not repose in fancied security that we can forever sell everything and buy little or nothing" coming from a man who had been identified all his life with the policy of exclusion have electrified the commercial world. The speech is a distinct indorsement of reciprocity, however much the high protectionists may regard it otherwise. They have been searching the speech for crumbs of comfort, but have found very few. Recognizing the demand for these prophetic utterances of the late president, the Boston & Lockport Block Co., No. 142 Commercial street, Boston, Mass., has printed the speech and bound it in convenient pocket form and will mail it to any one upon request.

Rear Admiral Bowles, chief constructor of the navy, will make a very important recommendation in his annual report, soon to be presented to Secretary Long. The recommendation relates to the subject which has been so much discussed recently, of the training of the men entering the naval service, and calls for the construction of six large sailing ships. Admiral Bowles is a strong advocate of the idea that the enlisted men of the navy should receive thorough training in seamanship aboard sailing vessels. He explains in the report the advantage to be derived from this training by giving the blue-jacket a thorough knowledge of sea work. It is argued that in no other way can he acquire properly a knowledge of the winds and currents.

The novel system of cableways, or trolleys, that has been installed over the Pacific liners building at the works of the Eastern Ship Building Co., New London, Conn., is now in successful operation. The structure is a most imposing one and has been favorably commented upon by all the experts who have had the pleasure of inspecting it. The cableway system permits of the handling of four large ship members at any one time, and the material can be picked up at any station on or near the ships and placed in any position desired. Electricity is used throughout. The Review hopes in the near future to be able to illustrate this novel and excellent manner of handling material, which at the present time is attracting general attention.

ENGLISH AND SCOTCH SHIP BUILDING.

During August Scotch ship builders launched twenty-one vessels of about 40,600 gross tons, as compared with twenty-three vessels of about 55,080 gross tons in August of last year, and thirty-one vessels of about 35,325 gross tons in September last year. In the nine months Scotch ship builders have launched 206 vessels of about 395,426 gross tons, against about 356,685 gross tons in the corresponding period of last year, about 367,526 gross tons in 1899, about 316,500 in 1898 and about 229,070 in 1897. English builders last month put into the water twenty-one vessels of about 68,180 gross tons, against thirty-one vessels of about 118,878 gross tons in August, twenty-nine vessels of about 73,547 gross tons in September, 1899, and thirty vessels of about 58,572 gross tons in September, 1898. For the nine months English builders have launched 206 vessels of about 709,113 tons gross, as compared with 200 vessels of about 539,309 tons gross in the corresponding period of last year, 224 vessels of about 634,460 tons gross in 1899, 255 vessels of about 624,108 tons gross in 1898, and about 448,882 tons gross in 1897. Two steamers, totalling about 20,500 tons gross were launched last month at Belfast, against one vessel of 6,767 tons gross in September last year. There have been launched in the United Kingdom during the past nine months 421 vessels aggregating about 1,209,530 tons gross, which is a record; this compares with 439 vessels of about 956,416 tons gross in the first nine months of last year, 481 vessels of about 1,067,143 tons gross in 1899, 535 vessels of about 1,019,908 tons gross in 1898, and 484 vessels of about 737,884 tons gross in 1897.

"LONG-ARM" SYSTEM OF POWER DOORS AND HATCHES.

The "Long-Arm" System Co. of Cleveland, O., announce the recent publication of their bulletin No. 5, giving full data regarding the "Long-Arm" System of power doors and hatches for the preservation of life and property at sea. The booklet will be forwarded upon application.

NEW SHIPPING BILL.

SENATOR FRYE WILL PRESENT IT AT THE OPENING OF CONGRESS—HE HAS SEEN THE PRESIDENT—ADVOCATES A DEPARTMENT OF COMMERCE.

Senator Frye, chairman of the committee on commerce in the senate, who was the author of the shipping bill first introduced by Mr. Hanna two years or more ago, and amended somewhat and introduced a second time by Mr. Frye himself, has made some further changes in the bill and will introduce it again at the coming session of congress. He has already seen the president upon the subject. It is understood that the president, in his message to congress, will definitely recommend legislation in aid of the merchant marine, but will leave the details to congress. Conferences will, however, be held with the president before the bill is presented. As every one knows, the last shipping bill had the support of two-thirds of the senate and was defeated merely by the filibustering tactics of the opposition. Senator Frye announces that he has been informed of the purpose of a number of large capitalists to construct ships whenever congress passes a bill that will put American ship owners on an equality with those of other nations. One of these projects is that of William W. Brauer, who has said that if congress passes a bill to give proper encouragement to American shipping he will immediately give out contracts for the building of six first-class passenger and freight steamers which he will put on a line from New York to Hamburg. Mr. Brauer said:

"These new boats will be built in the United States if the ship subsidy bill is passed, and they will be of 10,000 to 12,000 tons in size with accommodations for 150 first-class passengers, 1,000 steerage passengers and for 9,000 tons of dead-weight of freight. The line which is already established for freight between Philadelphia and Hamburg will be operated in connection with the Baltimore & Ohio railroad. In the present Philadelphia service, which was inaugurated at the beginning of the year, are the steamers the Hanover, the Tropic, the Blaamanden, the Aboukir and the Heckney. Another steamer is to be chartered in order to maintain a weekly service. None of the vessels is of less than 5,000 tons register. All of the new steamers will be designed to make the voyage in less than ten days."

The Baltimore & Ohio railroad has a traffic arrangement with Mr. Brauer, who runs a line of steamers out of Philadelphia. In discussing the shipping bill after his interview with the president, Senator Frye said:

"Some objections were made to the last shipping bill by the friends of government aid. I shall try, if I can without injury to the bill, to meet these objections. But what the features of the bill will be I do not desire to say at this time. I shall undoubtedly be prepared to present a bill at the next session of congress, and right upon its assembly, too. I do not believe I shall be able to present a measure which will be so promising of success as the old bill if it had become a law."

"So the concessions you will make in framing your bill will not meet your unqualified approval?"

"In my opinion they will not improve the bill, but they will improve its chances of adoption. The old bill was drastic, so drastic that it frightened a good many people, but the disease is one that requires drastic remedies. Our merchant marine was never in so bad a condition as it was last year."

"What has occurred to show the still greater necessity for a measure of this kind since last year?"

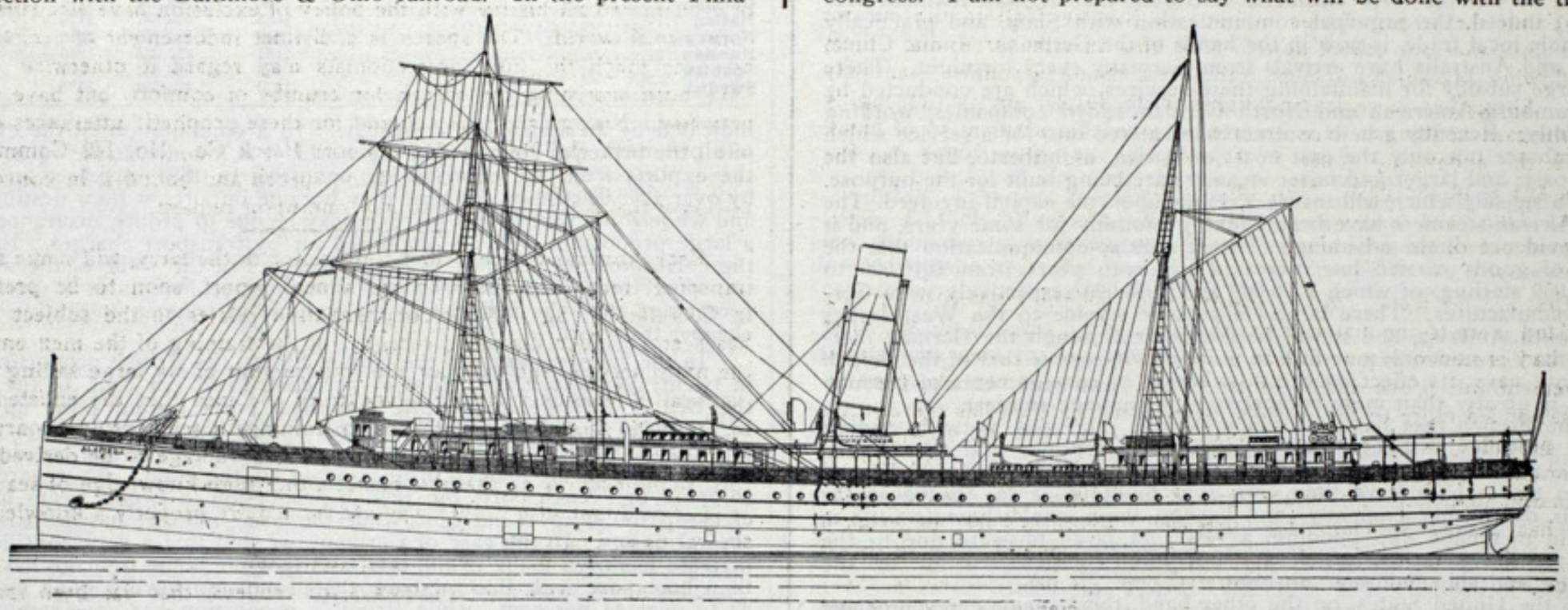
"England has had hearings through a commission and her people seem to be very greatly alarmed at the progress Germany is making on the ocean. Germany is exceedingly busy. She has established lines of ships everywhere where there is trade to be looked after in the future and has secured terminal facilities in all South American states. Our necessity for foreign markets is greater every day, as the increase in our production indicates."

"Do you regard this country as having special opportunities at this time for securing trade in China?"

"Undoubtedly there are special opportunities for the nation. We have the best position in this country in the world for Chinese trade with our new possessions and with the friendly feeling that exists on the part of China and Japan for our country. I think congress will do something about the Nicaragua canal in the coming session. If the newspapers correctly state the nature of the treaty which is to be presented to the senate I fail to see how any senator can object to it. I myself was in favor of the old Hay-Pauncefote treaty, and regard the objections made to that as absurd. I never believed in a canal which was not neutral. The idea of fortifying such a highway to me was always very absurd, and the privilege to do so is of no value whatever. The right to close it in time of war against any nation hostile to us seemed to me equally absurd. No nation would dare put her $4,000,000 or $5,000,000 cruisers into a canal if she was at war with us, and nothing would delight us more than for them to be in there. I think all the objections to that old treaty were sentimental.

"I think there will be some effort in the coming congress to establish a department of commerce. A bill was reported to that effect from my committee at the last session without objection, I think, on the part of any member of the committee. But there was no time to consider it. I think something will be done to relieve the present revenue cutter service from its unfortunate position. A bill was also reported at the last session from my committee in regard to that service, but there was no time to consider it. The main feature of that bill was the provision for the retirement of officers on a level nearly with the navy. Now there is no such thing as retirement for revenue cutter officers and therefore the head of that service gets all closed up. Several years ago I succeeded in getting an amendment on an appropriation bill retiring about thirty officers of the revenue service. Some of them were eighty or ninety years old and many of them were broken down from wounds received in the civil war and there they were. No secretary of the treasury would put them out and they stood in the way of active men. I got them all retired, but the thing is getting into the same condition again and there should be a permanent system for their retirement. This is one of the best services in the entire country. These officers are the hardest worked, most exposed and do the least loafing. They are at it all the time. Whenever there is a war they are on a par with the navy.

"I imagine there will be a good deal of talk about reciprocity in this congress. I am not prepared to say what will be done with the treaties now pending. I do not remember how many of them are dead by limitation. I do not wish to give any expression of my views touching them, as there is a bare possibility of my being chairman of the committee on foreign relations, the probabilities, however, being all against that, as I prefer very much to have the committee on commerce."



ALAMEDA OF OCEANIC STEAMSHIP CO'S. FLEET.

THE ALAMEDA'S NEW ENGINES.

The Oceanic Steamship Co.'s Alameda underwent her engineers' trial trip last week successfully. No attempt at speed was made owing to the presence of fog. From the time she was launched in 1883 up to last February the Alameda was in continuous service and during all that time never met with a mishap of any consequence, nor was she laid up for repairs. When the Ventura, Sonoma and Sierra were completed the directors decided to modernize both the Alameda and Mariposa. The former was the first to go out of commission and early in March she went to the Risdon Iron Works of San Francisco, that concern having received the contract to do the work. In the carrying out of the plans the old compound engines have been replaced by new triple-expansion engines with cylinders 29, 47 and 78 in. diameter by 58 in. stroke. Steam is supplied by two double-ended Scotch boilers, 15.3 ft. in diameter and 17.3 ft. in length, and one single-ended boiler, 14 ft. in diameter and 9.9 ft. in length, all fitted with natural draft and designed for a working pressure of 180 lbs. The gain in dead-weight carrying capacity for the round trip with the new equipment will be 1,000 tons. The old machinery was of 2,500 H.P. and gave an average speed of 13.8 knots per hour with a daily consumption of 65 tons of coal. The new machinery is of 3,000 H.P. and will give a speed of 15 knots upon 56 tons of coal. The ice machine and the refrigerating plant were built by the Risdon Iron Works and differ from others, being of the marine type, but especially for ship purposes, and have a refrigerating capacity equal to 15,000 ft. of space for each machine. The entire plant is in duplicate.

Maurice Hulin, president of the Panama Canal Co., is in this country for the purpose of laying before Rear Admiral Walker, chairman of the canal commission, a proposition for the transfer to the United States of the Panama canal. M. Hulin will endeavor to have the commission recommend to the president the adoption of the Panama canal route. The Panama Canal Co. has just issued a circular to its shareholders stating that Colombia is willing to sanction the transfer of the canal to the United States. It is also said that an estimate of value is being prepared at the request of the Isthmian canal commission.

SHIPPING AND SHIP BUILDING.

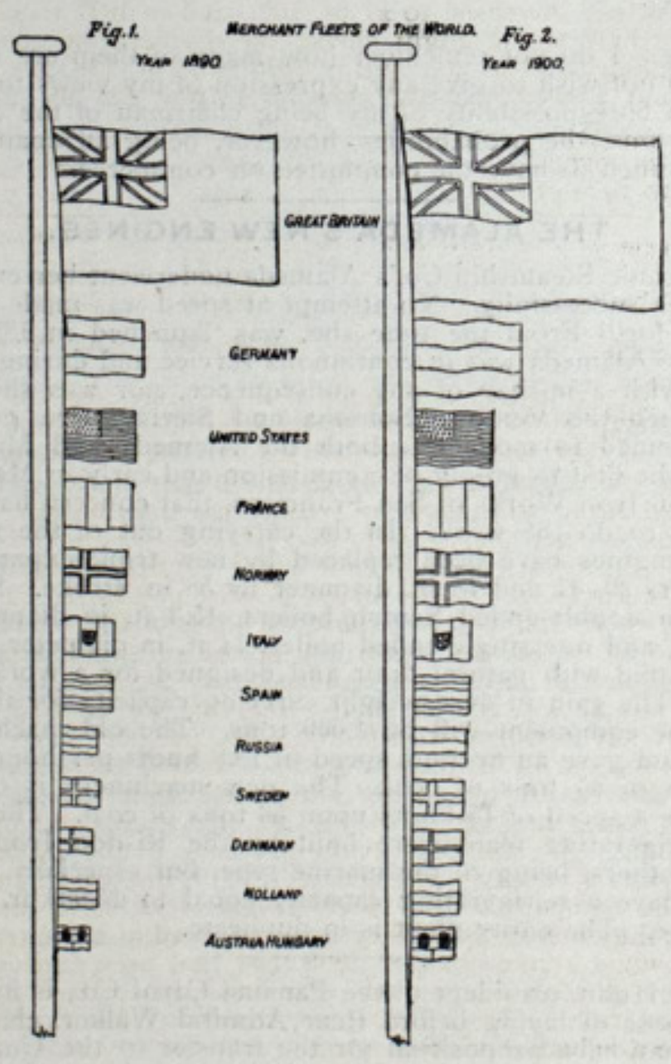
AN EXHAUSTIVE REVIEW SHOWING THE RELATIVE POSITION OF THE NATIONS DURING THE PAST TWENTY YEARS.

Engineering of London, in an exhaustive review of the competition in shipping and ship building, says:

The progress made by some of our industrial competitors in ship building and ship owning is very considerable, and its influence in the diversion of commerce is still more marked than statistics suggest. So long as the shipper has sufficient cargo for one, or even several ports consecutive upon an ocean route, to fill a ship of moderate size, it may be just as convenient to charter a tramp steamer belonging to any nation, always provided that the freight is low enough, and the British tramps are excellent in this respect. But with the beginnings of foreign commerce, the general experience is that the consignments are comparatively small, and that much canvassing over a wide area is necessary to secure a complete cargo even for a series of ports. In such a case it is of great importance to have trading steamers as distinct from the tramp, and that these steamers shall leave the manufacturing country at regular intervals, so as to distribute goods at stated periods. It will be recognized that, hitherto at all events, Britain has held an advanced lead, and that foreign nations have commonly had to send their foreign goods via London or Liverpool, to the disadvantage of the growth of their trade. The transshipment necessary in such case is not only costly, but results in breakage, as well as inconvenience. Germany fully recognized this a few years ago, and the results have been very striking. At the present time she has as many sailings across the Atlantic as Britain. She has a splendid fortnightly service to the Far East, her ships call at convenient ports, whence coasting vessels, as well as river steamers, distribute the German manufactures locally; indeed, the principal communication with Siam, and practically the whole local trade, is now in the hands of the Germans. India, China, Japan and Australia have arrivals from Germany every fortnight. There is a large subsidy for maintaining these services, which are conducted by the Hamburg-American and North German Lloyd companies, working conjointly. Recently a new contract was entered into for a service which will embrace not only the east coast of Africa, as hitherto, but also the west coast; and larger and faster steamers are being built for the purpose, under a subsidy which will insure a return upon the capital involved. The East African steamers have been running monthly for some years, and it is an evidence of the advantage of such regular communication that the value of goods carried has increased in seven years from £610,000 to £1,956,950 sterling, of which £300,000 and £955,000 respectively were German manufactures. There is also a regular service to the West Indies and South America, and it will be seen that although the German merchant navy is now only one-fifth in point of tonnage of that of the British merchant navy, its effect on the distribution of consignments of German goods is greater than mere comparisons of tonnage suggest.

The French fleet has not been materially increased, notwithstanding heavy subsidies, although the Messageries Maritimes and the French Trans-Atlantic Co. have done great service in the promotion of French foreign trade; both have their own ship building yards—inadequate as regards the former company—and beyond these establishments little is done in merchant ship building, a result in large measure due to the high protective tariffs, which are not fully compensated for by the shipping and ship building subsidies.

In the United States, on the other hand, there seems every prospect of a new subsidy scheme being brought forward, as it is recognized that



much good might accrue from regular sailings to foreign ports. The only distinctly American lines are those to Southampton, and another across the Pacific; and Americans reproach themselves with the surprising fact that only 13 per cent. of the foreign import trade, and 7 per cent. of the foreign export trade, is carried in American vessels; whereas in the days of the old wooden sailing ships, 25 per cent. to 30 per cent. was the average. The decrease has been very gradual. The increase in American merchant shipping in recent years has been largely on the great lakes and in the coasting trade of the United States. But a new period is at hand, when the United States will endeavor to gain the same position with a modern merchant fleet that she once enjoyed with her famous wooden sailing ships.

Diagram Figs. 1 and 2 illustrate by a series of flags the growth of the principal merchant fleets of the world during the past ten years. In this diagram it is assumed that three sailing-ship tons are only equal to one steam ton; thus the diagram is on the basis of steam tonnage, and is consequently a more accurate measure of the carrying capacity of the respective fleets than if sailing and steam tonnage had been reckoned of equal importance. Reckoned on this basis, the British tonnage has increased from 8,584,600 to 11,700,000; the German tonnage has increased from 1,146,000 to 2,116,000; and the United States tonnage from 952,900 to 1,131,151; the only other increases worth noting are those of Norway, from 693,000 to 1,056,600; of Russia, from 246,500 to 476,900; and of Sweden from 279,900 to 456,000. Generally speaking, each nation has considerably increased its carrying capacity, although in varying proportions. The vast value of the shipping trade of the world may be

TABLE I.—RECKONING SAIL AND STEAM TONNAGE AS EQUAL, THE TONNAGE IN 1890 AND 1900 WAS AS FOLLOWS:

	1890.		1900.	
	No.	Tons.	No.	Tons.
United Kingdom	9167	10,241,856	8914	13,241,446
British colonies	2904	1,355,250	1924	1,019,808
America, United States of	3272	1,823,882	2820	2,035,062
Austria-Hungary	368	269,648	270	416,084
Danish	808	280,065	802	519,011
Dutch	544	378,784	406	530,277
French	1,380	1,045,102	1214	1,350,562
German	1876	1,569,311	1710	2,650,033
Italian	1555	816,567	1176	983,655
Norwegian	3369	1,584,355	2380	1,640,812
Russian	1181	427,335	1246	720,901
Spanish	883	534,811	597	694,780
Swedish	1470	475,964	1433	637,272

indicated by an approximate estimate. In a computation of the exports of all the principal countries in the world, it is found that the value of all the exports from the contributing countries in 1886 increased in value by over £200,000,000 by the time they became imports at their destination; and while some part of this increase may be due to profits, insurance, etc., a large proportion is to be accounted for by transport charges. In 1898 the corresponding advance—a rough measure of the value of the world's transport trade—was £228,000,000. The increase here is at a much less percentage than the addition to the volume of trading, indicating much cheaper transport.

In the carrying trade of the United States, the British proportion has in twenty years increased from 51 per cent. to 57 per cent. of the total, the British tonnage frequenting American ports having gone up from 15,000,000 to 25,000,000. The German tonnage has increased from 2,225,000 to 4,614,000 tons; but with the exception of Norway and Sweden, the other increases are barely proportionate to the total. As regards the shipping in French ports the British proportion in twenty years has increased from 40 to 47 per cent, while the home tonnage has decreased by several points. In the case of Germany we find that a very considerable increase has been made in the total and that the home tonnage has more than kept pace with this increase, the proportion having gone up from 39 to over 44 per cent., while Britain's proportion has considerably decreased—from 37 to 32 per cent. As regards Russia the British position has improved, but Italy has captured the larger proportion of the augmented tonnage frequenting her own ports, the ratio of Italian tonnage having increased from 34 to 44 per cent., while the British has decreased to 26 per cent. In the Belgian tonnage the foreigner has made greater progress than ourselves, due largely to German ships, while in Sweden and Norway we fail to hold our position. In respect to Holland our position has barely kept pace with the total tonnage. As to Britain it may be said that the foreign tonnage frequenting our harbors has in twenty years increased from 17,300,000 tons to 35,000,000 tons; if we eliminate ships in ballast and take only sailing and steam vessels with cargoes, the increase is practically in the same proportion—13,750,000 tons to 27,500,000 tons. Of the total increase in fifteen years of 25,000,000 tons of shipping entering or leaving the United Kingdom with cargo only 13,000,000 is due to the foreigner and barely 12,000,000 to the British ships. Of all shipping in our harbors in 1880 29.6 per cent. carried foreign flags while now the proportion is 34 per cent.

Coincident with development of home tonnage for home requirements, there has been a steady aim in competing countries to develop the ship building industry. The tendency during the past decade to increase naval armaments has enormously assisted this, for patriotic reasons have suggested the building of those warships at home; at the same time the great ship owning companies were encouraged—a stronger word might even be used—to have their vessels built at home. Existing ship building yards have thus been largely developed to undertake a class of work which fifteen years ago was unknown to them. Formerly all large passenger steamers for Germany, Austria, America and other countries were built in Great Britain, and it was the rule that complete drawings had to be supplied with each ship. It might be easy from this source to trace the evolution of the large ships built by some of our industrial competitors, but, at the same time, it must be frankly admitted that there have been, particularly in recent years, departures which suggest distinct originality. At the present time our greatest competitor in ship building is Germany; this is due in some measure to the combination of cheap labor with efficient machine tools; in fact, some of the works of Germany are at least as well equipped as those on the Clyde. Without entering into details, it may be said that wages are lower. The engineers, for instance, working on the construction of the great Atlantic liners are paid about half the hourly rate obtaining in some establishments in this country; and although the economy or efficiency of the labor may be less, the total labor cost of work is under that ruling in this country. In America, on the other hand, wages are higher, and since labor-saving machinery can enter into the cost of building ships only to a more or less restricted extent, the labor cost of a ship is greater, probably from 10 per cent. to 15 per cent. Material, on the other hand, is cheaper in America;

and wherever it is possible machinery has been adopted to a greater extent than in this country. In spite of high labor, new ship building yards are being installed in the United States, for the execution of government, as well as of private, contracts.

It is difficult to obtain accurate comparative data on the relative cost of ships, because of the great variations in design, and the fact that the ocean steamer of British build differs much from the coasting or lake steamer as constructed in America. Lake steamers are efficient cargo carriers. The largest of these carry about 8,000 tons, and, fitted with quadruple-expansion engines supplied with steam from water-tube boilers, costs at present from £9 to £10 per ton of deadweight, while 3,000-ton steamers cost from £11 to £11 10s. per ton. In this country the ocean tramp, to take 4,000 tons at 9 knots, cost £10; the 6,000-ton 10-knot steamer, £9 10s., and the 10,000-ton 11-knot steamer, £12 per ton deadweight carrying capacity; so that, even allowing for the lighter scantlings, the American lake ship is not much costlier than the British steamer. In the lake districts, where there are special facilities in the way of steel and coal, the only chance of competition at present with British builders appears to be in the event of a trade being developed between the lakes and the Atlantic; a practice already inaugurated. The canal lock which limits the dimensions for vessels to trade between the inland lake ports and the Atlantic is 270 ft. long, 45 ft. wide, and 14 ft. deep.

In the prices given above there has been an advance of 50 per cent., so far as Britain is concerned, as compared with those of a few years ago, largely owing to the cost of labor, not only in the ship building yard, but at the steel works. It is doubtful if in the immediate future labor rates will recede to their former level. It is interesting to note the relation of the cost of labor to the total cost in regard to British ships. Table II indicates such costs now and ten years ago for different classes of ships constructed at the works which are amongst the best in this country so far as machinery and management are concerned. It should be noted that wages have considerably increased during the ten years referred to, so that in the comparison some allowance must be made for this where the intention is to ascertain the effect of improved mechanical appliances towards the greater economy of labor. In the case of the hull there seems practically no change, the slight increase shown in several cases being probably due to the higher rate of wage. Generally there has been a slight decrease in the labor cost of the engines, which is, perhaps, the result of the introduction of automatic machine tools and increased cutting speeds in lathes and the like. But in the case of boilers there is no marked improvement. Modern high pressures demand more careful workmanship, so that the labor bill is necessarily higher. Commendation may here be expressed for practice now being introduced in one or two of the American works where a mathematician is specially engaged to work out formulæ for establishing the length of time necessary for any job in the machine shop. The needed speed, cut and traverse being thus ascertained, the machine-man, when he gets the job, has this data before him, and is thereby informed of the time a job should take, and how it may be accomplished within that time. The result is said to be a marked economy. The limited application of machinery in the building of the ship has till now militated against the extension of the American merchant marine; but should congress pass a subsidy bill, it will compensate the ship owner for the higher capital charge involved in building in the states owing to dearer labor, and there will then be every prospect of a great extension in American merchant ship building in the immediate future. At present there are about ten yards on the United States seaboard capable of producing the largest vessels, besides a number of firms who have facilities for moderate-sized steamers, so that the economic condition is the only obstacle to pronounced success. This is being improved by the extensive additions to the American navy now decided on and under consideration.

TABLE II.—SHOWING LABOR COST IN SHIP CONSTRUCTION.

	Date.	Cost of labor in relation to total cost. Hull. per cent.	Engines. per cent.	Boilers. per cent.
Channel passenger steamer	1890	41.7	28.4	38.6
Channel passenger steamer	1900	41.6	28.8	30.7
Cruiser	1887	42.3	29.4	38.8
Cruiser	1899	46.6	20.4	35.2
Battleship	1891	46.8	21.8	40.0
Battleship	1897	49.6	24.7	41.5
Cargo steamer	1889	38.2	23.8	35.0
Cargo steamer	1900	40.1	22.7	39.9
Paddle steamer	1891	40.9	32.5	37.8
Paddle steamer	1898	42.0	30.5	38.8

In Germany there has been a steady advance in the number of ship building works, as the following table indicates:

TABLE SHOWING GROWTH OF SHIP BUILDING IN GERMANY.

Year.	Number of Works.	Number of Workers.	Ship building Slips.	Docks.
1870	7	2,800	16	2
1880	18	8,500	47	9
1890	25	21,800	103	17
1900	39	37,750	154	27

Simultaneously with this increase in the number of such works, there has been a material growth in auxiliary industries, particularly in the production of steel plates for ship building, which are now exported to the Clyde and elsewhere. Again, although raw material is admitted to Germany free of duty, the quantity imported in 1899 was only 39,000 tons, as compared with 52,000 tons in the preceding year; at the same time the total tonnage of steel actually used had increased from 69,000 to 85,000 tons.

In 1872 Japan possessed ninety-six merchant steamers of an aggregate tonnage of 23,364 tons. They were all, without exception, vessels which had been condemned by their original owners as unfit for further profitable service, were ill-found and ill-managed, and never ventured beyond the coasts of Japan. In 1900 her merchant fleet included 846 steamers of 528,321 tons, most of them vessels of the highest types of modern construction, thoroughly equipped in every respect, well-managed, and successfully competing, to all parts of the world, with the best shipping lines.

COMMERCE OF THE SUEZ CANAL.

The number of ships which passed through the Suez canal last year was 3,441, representing a gross burthen of 13,699,200 tons. The corresponding movement in 1899 comprised 3,607 ships, with a gross burthen of 13,815,900 tons; in 1898, 3,505 ships, with a gross burthen of 12,960,600 tons; in 1897, 2,986 ships, with a gross burthen of 11,123,400 tons; and in 1896, 3,406 ships, with a gross burthen of 12,039,800 tons. The total of 3,441 ships which passed through the canal last year was made up as follows: German, 462; British, 1,935; Austro-Hungarian, 126; French, 285; Italian, eighty-two; Japanese, sixty-three; Dutch, 232; and Russian, 100. No other country contributed a total of fifty ships, the United States only furnishing twenty-two, the Argentine Republic one, Belgium seven, Denmark twenty-seven, Spain thirty-four, Greece two, Norway and Sweden thirty-two, Turkey twenty-eight, and Portugal eight. The movement of passengers through the canal last year comprised 282,000 persons, of whom 154,000 were soldiers. Of these latter, 47,000 were Russian, 43,000 French, 26,000 German, and 13,000 English. The proportion of British ships passing through the canal has been declining for some years past, while that of German shipping has been increasing. The proportions sustained by the flags of the ships which passed through the canal during the last three years were as follows:

Flag.	1898. per cent.	1899. per cent.	1900. per cent.
British	67.1	65.5	56.7
German	10.4	10.8	15.0
French	6.9	6.8	8.5
Dutch	4.1	4.2	5.2
Spanish	1.8	1.2	1.1
Italian	1.6	1.5	1.8
Russian	1.9	1.9	3.3
Austrian	2.3	2.7	3.4
Japanese	2.0	2.3	2.6
Miscellaneous	1.9	3.1	2.4
Total	100.0	100.0	100.0

As regards the description of the goods and commodities which passed through the canal last year, the effect of the deficit in the cereal crops of British India was sharply felt in the first half of 1900. In the first six months of last year the transit revenue fell off £165,882. The second half of the year showed, however, an increase of £138,075; this was explained by the large movement of European troops to China and also by a slight revival in business. The movement of wheat, rice, jute, and linseed through the canal from the east to Europe during the last three years is given in the table appearing below. In the movement through the canal from Europe to the east, British exports of salt and coal showed some reduction last year. As regards coal, the falling off was no less than 265,000, namely, from 876,000 tons in 1899 to 611,000 tons in 1900.

	1898. tons.	1899. tons.	1900. tons.
Wheat	484,677	416,164	477
Rice	185,871	211,207	238,373
Jute	367,570	291,141	285,132
Linseed	202,045	189,348	155,187
Total	1,240,163	1,107,860	679,169

Although the Suez canal is not exempt from the fluctuations which appear to be inevitably incident to all human affairs, the canal has gradually increased in value as a property during the last thirty years. The great waterway was opened for business in November, 1869; and during the period over which its construction extended the shareholders received an interest of 5 per cent. out of capital. In 1870 they had to depend for the first time upon the revenue earned, and the 5 per cent. which they had previously received was maintained. The same may be said of 1871, 1872, 1873, and 1874; but the shares of the canal company gradually increased in value, as the traffic was liberal enough to induce hopes of a larger distribution of profits being made. This expectation was realized in 1875, when the dividend upon the £20 shares advanced to £1 1s. 6d. In 1876 the dividend further increased to £1 2s. 10d., and in 1877 to £1 6s. 5d. In 1878 and 1879 there was a slight check, the dividend on the first of the two years receding to £1 5s. 6d., and in 1879 to £1 3s. 11d. per share. The £20 shares stood, however, at the close of 1879 at £28 19s. 2d. each. In 1880 the canal began to earn dividends with a vengeance, the distribution for that year being £1 17s. 6d. per share, while that amount was carried in 1881 to £2 15s. per share, in 1882 to £3 4s. 11d. per share, in 1883 to £3 10s. 1d. per share, and in 1884 to £3 9s. 9d. per share. The next two years witnessed some falling off in profits, the distribution for 1885 declining to £3 8s. 4d. per share, while that for 1886 was only £3 0s. 3d. per share. In 1887, however, the dividends began to pick up again, the return for that year being £3 2s. 8d. per share, carried in 1888 to £3 11s. 6d. per share; in 1889, to £3 12s. 11d. per share; in 1890, to £3 14s. 1d. per share; and in 1891, to £4 9s. 8d. per share. A period of slight depression now set in, the dividend for 1892 being reduced to £3 13s. 8d. per share, while that for 1893 was £3 17s. 8d. per share, and that for 1894 £3 17s. 3d. per share. In 1895 the dividend rallied to £3 19s. 6d. per share, and in 1896 it further advanced to £4 0s. 5d. per share. In 1897 there was once more a set back to £3 18s. 1d. per share, but in 1898 there was a recovery to £4 6s. 2d. per share, in 1899 to £4 13s. 2d. per share, and in 1900 to £4 13s. 3d. per share. We are thus in the presence of the encouraging fact that last year was the most remunerative in the history of the undertaking. While the company's £20 shares stood, as we have just shown, at £28 19s. 2d. at the close of 1879, they had advanced at the close of 1889 to £91 16s. 10d., while at the close of 1899 they had been further carried to £144 16s. Their price in August this year had further crept up to £146 4s. The British government has a large investment in Suez canal shares, and they constitute a valuable national asset.

Mr. Seward Webb of the New York Central made a tour of Nova Scotia last week in a special train. In an interview he stated that either Sydney or Louisburg would eventually be the terminus of a fast Atlantic passenger line and intimated that it might be associated with New York Central interests.

OPPOSED TO THE BARGE CANAL.

At a special meeting of the board of directors of the Maritime Association of the Port of New York on Monday of this week the board, by a vote of nine to three, refused to adopt a motion made by Gustav H. Schwab favoring the construction of the 1,000-ton barge canal as recommended by the canal committee appointed by the governor of the state. On Wednesday of last week, at the regular monthly meeting of the board, an attempt was made by Mr. Schwab to disapprove of the action of the executive committee of the Maritime Association in withdrawing from membership in the Canal Association of Greater New York and in declining to participate in the New York commerce convention to be held in Syracuse this week. This effort was defeated by a vote of seven to four. Thereupon Mr. Schwab moved the adoption of the resolution favoring the construction of the 1,000-ton barge canal and this was tabled by a vote of six to five. Messrs. Schwab, Kinkle and Romaine, all members of the board, then signed a request for a special meeting to consider the resolution, in accordance with which request the meeting was held on Monday, resulting as above stated. In opposing adoption of the resolution, President Kunhardt made the following statement:

"In objecting to the adoption of the resolution favoring the construction by the state of a 1,000-ton barge canal, my purpose is to keep the Maritime Association of the Port of New York free from possibly embarrassing entanglements. I have deeply at heart the advancement of the maritime and commercial interests of this port and of the state. I believe that our association can best further that object by retaining complete independence of action. This association of ours is formed for the advancement and conservation of the interests represented by its members. With 1,100 members, the association free of debt, a substantial sum of reserve funds at interest, we are quite sufficient unto ourselves, and equally capable of forming our own opinions and of acting independently in matters of direct self-interest. In my judgment there are a number of excellent reasons why it would be unwise at this time to advocate the construction of a 1,000-ton barge canal by the state. I shall briefly enumerate some of the chief objections to its construction:

"1. Its value would not be commensurate with its cost.

"2. It would give us a canal having but one-half the capacity of existing Canadian canals.

"3. It would cost $87,000,000. This, at 3 per cent. interest, Gov. Odell pointed out in his message on canals to the legislature last year, would involve an annual tax of $5,399,789 for eighteen years, in addition to the present annual tax for maintenance and repair. This would involve an expenditure almost equal to $2 per ton upon the total traffic upon all the canals last year. Even at the maximum capacity of the 1,000-ton barge canal the annual tax for eighteen years would equal more than 50 cents per ton.

"4. Its commercial necessity is not apparent.

"5. It is opposed by the governor and the senate of this state.

"6. I believe the people would refuse to bond the state for such an amount.

"7. By completing the improvement of the canals, as begun in 1895, the traffic upon the Erie canal would be quadrupled without overtaxing the capacity of the waterway.

"8. Before spending such an enormous sum as $87,000,000 on canal enlargement, we should demand and secure legislation for the abatement of excessive charges at terminals.

"9. By removing the restrictions upon our commercial expansion by securing legislation for the correction of abuses at terminals, we would undoubtedly attract to the canals a greatly increased commerce, and should that increase later threaten to overtax the capacity of the waterway, that would be the time to consider what form of further enlargement should be undertaken."

PAN-AMERICAN AWARDS.

The Buffalo Forge Co. is among several concerns well known to readers of the Review that carried off awards at the Pan-American exposition. They were awarded two gold medals and a silver medal for excellence of apparatus under the machinery classification. The gold medals were for a 500 H.P. high-speed, tandem-compound engine operating in the service power plant and for the Buffalo fan system of heating and ventilating using Buffalo blowers and fans. The silver medal was for Buffalo hand punches and shears and for Buffalo forges, induced draft apparatus and blacksmith drills. This latter was the highest award given for articles of this nature.

The highest award at the Buffalo exposition was also secured by the Robins Conveying Belt Co., Park Row building, New York. At the Paris exposition the Robins company also secured the highest award. Their exhibits at Buffalo consisted of two full-sized 20-in. conveyors with automatic self-reversing tripper in operation in the machinery and transportation building, and two model belt conveyors on a scale of 3 in. to the foot with automatic self-reversing tripper in operation in the mining building. The conveyors have been in operation every day since the expositon opened and have attracted a great deal of attention.

The ash ejector made by Horace See of No. 1 Broadway, New York city, is also in the list of gold medal awards, the jury consisting of Rear-Admiral Geo. E. Belknap, U. S. N.; Commodore Thomas Williamson, U. S. N.; Capt. Richmond P. Hobson, U. S. N.; Capt. C. F. Shoemaker, chief of United States revenue cutter service; Professor of Mathematics Philip R. Alger, U. S. N.; Capt. J. P. Wisser, commanding seventy-third company, United States coast artillery, U. S. A.; Capt. Peter C. Harris, ninth regiment infantry, U. S. A.; Capt. Victor Hernandez, artillery corps, Mexican army.

Another concern that carried off the highest award at Paris and is now similarly honored at Buffalo is the American Steam Gauge & Valve Mnfg. Co. The gold medal awarded to this company is for gauges, pop valves, indicators and engineering specialties.

As noted elsewhere in this issue the steam towing machine manufactured by the American Ship Windlass Co., as well as the steam winch manufactured by the same company, carried off highest awards at Buffalo.

Low Rate Excursion to New York via B. & O.—Tickets on sale daily until Oct. 20 with privilege of returning via Buffalo. Call at city ticket office, 241 Superior street. Oct. 20.

SHIPPING ON LAKE ERIE IN 1837.

Mr. F. A. Ketchum of Huron, O., sends to the Review a clipping from the Huron Commercial Advertiser of April, 1837, from which we make the following excerpt:

"The trade of the west has within the past five years outstripped the most wide calculation, and our commercial facilities have increased in a proportionate ratio. From a statement recently published in the Buffalo Commercial Advertiser it appears that there are now afloat on Lake Erie fifty-eight sloops, 148 schooners, seven brigs, one barque, two ships and forty-seven steamboats. The tonnage owned at the different ports is as follows: Buffalo, 8,541; Detroit, 6,703; Cleveland, 4,518; Sandusky, 1,792; Presque Isle (Erie), 1,562; Miami, 927. Ten years ago, and only five moderate sized steamboats floated on our waters, and these five did hardly a living business; now, all those in service are in full employ during the navigation season, and at no former period have their profits been so great as during the past year. But ten years since, fifty or sixty vessels plied on the lakes and engrossed all the carrying trade. Within the next ten years we predict 1,000 steamboats and sail boats, of an average tonnage equal to those now employed, will whiten Lake Erie, and crowd our ports, adding millions to our commercial wealth and thousands on thousands to our population, our warehouses choked with merchandise, receiving and discharging their storage, our steamboats and shipping groaning under their enormous cargoes and literally alive with travelers and immigrants arriving and departing; and our mills taking in their millions of wheat from far west and lading into canal boats their rich products of flour for the Atlantic ports."

There is here no mention made of iron ore and railways. The article antedates both.

SPEAKER HENDERSON ON THE SHIPPING BILL.

Speaker Henderson of the house of representatives gave out the following interview the other day, which may or may not mean that he is opposed to the shipping bill as framed by Senator Frye. At any rate his meaning is decidedly ambiguous and his friendliness to the shipping measure in question. Under the rules of the house, introduced by Reed, it is a practical impossibility for any measure to pass to which the speaker himself is opposed. The speaker controls absolutely the order of the day's program and he can sidetrack any measure in which he is not interested. This is what he says on the shipping bill:

"I have never discussed specifically the question of building up the merchant marine and the great shipping interests of the United States, but this question can no longer be neglected by those looking to the best interests of our country. It is a new problem to us to give financial aid to the shipping interests and I confess that I am not satisfied with any legislation thus far proposed by congress, but if a wise plan can be devised looking to the interests of our commerce and the country and not purely individual interests, then it should command careful, patriotic and fearless attention."

POCAHONTAS COAL & COKE CO. ORGANIZED.

Articles of incorporation under the laws of New Jersey have been filed in Trenton for the Pocahontas Coal & Coke Co. with a capitalization of $40,000,000 by Judge E. H. Gary of the United States Steel Corporation. Judge Gary and Max Pam, counsel for the American Steel & Wire Co., have had control of the affairs of the syndicate. Options were first secured on leases for about 325,000 acres in the Pocahontas coal fields, known locally as the Flat Top district of Virginia and West Virginia, but world wide as the Pocahontas district. This having been accomplished, the plan for a capitalization of the company at $40,000,000 was developed. The stock will be divided, half common and half preferred. There were to be $20,000,000 of bonds authorized, and $9,000,000 issued now. Blair & Co. are the financial agents of the corporation, and have begun issuing negotiable certificates to subscribers to the stock. It is understood that 75 per cent of the stock has been paid in. The Flat Top Coal Land Association has an output of nearly 6,000,000 tons yearly, which is distributed to the ends of the world, and known world wide as Pocahontas coal. No other coal in the world is so well known as this, with the possible exception of Cardiff coal, mined in Wales. Europeans generally call any American coal Pocahontas, so well known abroad is the output of that particular district.

ITEMS OF GENERAL INTEREST.

Delaunay, Belleville & Co. of St. Denis, manufacturers of the Belleville water-tube boiler, have just received an order from the French government for an equipment of sixteen generators with economizers, aggregating 12,000 H. P., for the cruiser Magenta.

The immense floating dry dock, built by the Maryland Steel Co. for the United States government, started on Tuesday of this week on its journey to Algiers, La. It is expected that the trip will occupy about a month. The dock is being towed by the steamship Orion, three cables, each 1,200 ft. long, being used. The cost of this immense structure was $810,000.

Mr. Charles W. Morse of New York has confirmed the report that he has purchased the International Steamship Co., which operates between Boston and provincial ports, and the Portland Steamship Co., which operates between Boston and Portland. Mr. Morse is also interested in the Maine Steamship Co., which plies between New York and Portland. He says that it is his intention to build several steamships to operate on the lines and to make other improvements.

The Elder-Dempster Steamship Co. has just launched from the yards of Messrs. C. S. Swan & Hunter, Ltd., Wallsend-on-Tyne, the large twin-screw steel steamer Lake Michigan, for use in its Montreal service. The vessel's leading dimensions are: Length over all, 483 ft.; beam, extreme, 56 ft.; depth, molded to upper deck, 34 ft. 10 in. The vessel will be rigged as a four-masted schooner, and the facilities for working cargo will be unusually complete.

A new chart, in colors, of Erie harbor and Presque Isle, has just been issued and may be had from the Marine Review. A new chart of Buffalo harbor and Niagara river to the falls is also in print.

AROUND THE GREAT LAKES.

Mr. S. A. Whipple, a well known marine artist of Detroit, died of paralysis last week. He had, at one time, been a vessel captain.

Officials of the Duluth & Iron Range Ry. contemplate an expenditure of about $160,000 during the coming winter in improving one of the ore docks at Two Harbors.

Johnston Bros. of Ferrysburg, Mich., have just launched for the Buffalo Dredging Co. a steel dredge hull of 116 ft. length, 40 ft. width and 13 ft. depth. Machinery will be installed in Buffalo.

Capt. George P. McKay, chairman of the committee on aids to navigation of the Lake Carriers' Association, has received word from the deputy minister of marine and fisheries at Ottawa that the red gas buoy, now on Southeast shoal, Point au Pelee passage, Lake Erie, will be moved at once to the south end of the east side of the cut through the bar at the mouth of the Detroit river. The lightship Kewaunee, of course, now marks Southeast shoal.

The four steamers of the Northwestern Steamship Co. of Chicago, each of which have made a single trip to Europe via the Canadian canals, will be employed in the coastwise trade this winter. It is expected that in the spring they will return to the lakes and engage in the grain and ore trade, but there is nothing definite on this score as the owners will probably be guided by freight conditions on the seaboard as compared with the lakes. It is not likely that they will again engage in the European trade, as the company claims the insurance rates to be almost prohibitive.

Another dividend, the regular 1¾ per cent. quarterly, was paid on Tuesday of this week on the preferred stock of the American Ship Building Co. A division of earnings amounting to 1¾ per cent. of the preferred stock has been made every three months since organization, more than two years ago, and the surplus that is at the same time being built up from the very active business of the company is probably already sufficient to care for preferred dividends for two or three years to come, even under conditions that would admit very small earnings compared with what is now being made.

Geo. E. Tener of Pittsburg and John A. Donaldson of Cleveland, well known in vessel circles on the great lakes on account of large coal shipping interests which they represented previous to the formation of the Pittsburg Coal Co., have just completed arrangements that will make them competitors of the big organization in the lake trade. They will manage affairs of the National Dock & Fuel Co., recently organized with a capital of $300,000. Mr. Donaldson is now opening up offices in the Perry-Payne building, Cleveland, and expects to have work started before the close of navigation on a car dump machine, to be located on the Cleveland lake front within the eastern breakwater enclosure. Officials of the new company are: George E. Tener of Pittsburg, president; Selwyn M. Taylor of Pittsburg, vice-president; M. K. Salsbury of Pittsburg, treasurer, and John A. Donaldson of Cleveland, secretary and general manager.

TRADE NOTES.

The Cleveland Punch & Shear Works Co. has several orders in hand for unusually heavy machinery. A double-acting plate planer is under way to the order of the Riter-Conley Mfg. Co., Pittsburg, and an angle shear for the Garry Iron & Steel Co. of Cleveland, and a miscellaneous lot of punches and rotary planers being at the present time in process of erection.

An order for thirty-two sets of releasing hooks—automatic hooks that are among the best life saving devices ever invented—has just been received by the Standard Automatic Releasing Hook Co. from the Eastern Ship Building Co. of New London, Conn. This detaching gear is for the life boats that are to be carried by the big Hill Pacific liners building at New London.

A note from the Cleveland Punch & Shear Works Co. of Cleveland is as follows: "Our No. 5 catalogue of 'Cleveland' iron working tools is now in the press, and will be ready for distribution about the middle of next month. This will be the most elaborate catalogue we have ever issued, and we would like the address of every manufacturer who is interested in our line, so that we may mail a copy of this edition."

The London office of the Buffalo Forge Co., recently opened at 39 Victoria street, London, S. W., under the management of D. W. Roper, M. E., has closed an important contract in connection with the new plant of the British Westinghouse Electric & Manufacturing Co. at Old Trafford Park, Manchester, England. This contract is for apparatus to be used for heating and ventilating the machine shop, foundry stores, the carpenters' shop and box factory of the Westinghouse company. The machine shop building is 900 ft. long, 420 ft. wide and 59 ft. high. To accomplish the heating and ventilating of this area eight steel-plate fans, each one capable of delivering 60,000 cu. ft. of air per minute, and driven by a separate induction motor, will be provided; also a separate heater for each fan, a total of more than ten miles of 1-in. pipe being used.

For navigation charts apply to the Marine Review.

WANTED—Ship Draftsmen. A competitive examination will be held at the Washington Navy Yard, November 20, 1901, for the purpose of establishing an eligible register of ship draftsmen and assistant ship draftsmen. Pay of ship draftsmen ranges from $3.60 to $5.04 per diem; that of assistant ship draftsmen ranges from $2.00 to $3.28 per diem. For application and further information apply to Commandant, Navy Yard, Washington, D. C. Oct. 24.

"The Old Way."

SENT ON TRIAL.

SIZE	ADAPTED TO
00	(Long Stroke) Riveting up to 1 inch.
0	Light riveting.
1	Extra heavy chipping.
2	Chipping and heavy calking.
3	Light chipping, calking and beading flues.
4	Beading Flues and calking.
5	Beading, light calking and chipping.
6	Light chipping and scaling.

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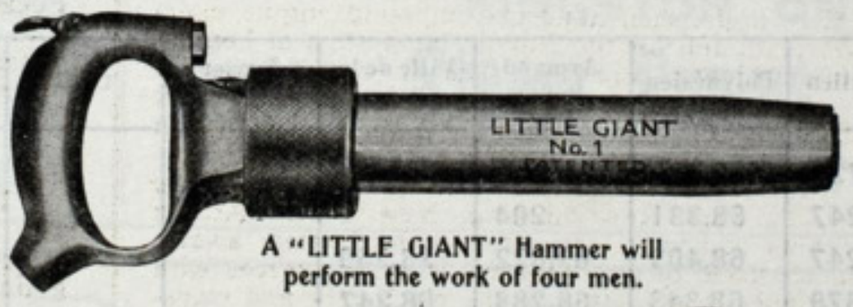
STANDARD OF THE WORLD.

Particularly Designed for Use in Ship Yards.

Having no delicate parts or vibration, they cause the operator no annoyance. If you want a Hammer that you can depend upon, one that will do good work, and do it quickly, order a "Little Giant." They never disappoint. The illustrations show the value of these Hammers in chipping castings. A proportionate saving can be effected on all classes of riveting, calking and beading.



A "LITTLE GIANT" Hammer will perform the work of four men.

Write for Catalogue "F."

"The New Way."

STANDARD PNEUMATIC TOOL CO.

Manufacturers of Air Drills, Hammers, Motor Chain Hoists, Reversible Flue Rolling, Reaming, Tapping and Wood Boring Machines, and Pneumatic Tools and Appliances of Every Description.

GENERAL OFFICES: Marquette Bldg., CHICAGO.

EASTERN OFFICES: 141 Broadway, NEW YORK.

PROGRESS OF WORK AT NEWPORT NEWS.

Newport News, Va. Oct. 16.—All of the preparations for the launching of the new Pacific Mail liner Siberia Saturday morning have been completed at the ship yard and all indications now point to an event of equally as great importance as the launching of her sister ship, the Korea, March 23 last. Miss Belle Norwood Tyler, daughter of Gov. J. Hoge Tyler, Virginia's executive, has been selected to christen the ship. This fact alone insures an unusually large crowd of excursionists from Richmond. Gov. Tyler, accompanied by his entire staff, will attend and other notables will be present from the state capital, as well as from other cities in Virginia and nearby states. Every railroad and steamer line touching the Hampton Roads cities will run excursions here Saturday morning. Owing to tidal conditions the Siberia will not go overboard until 1 o'clock, being the first afternoon launching to occur here.

For a time it was believed that the new Morgan liner El Alba would go overboard at the ship yard on the same day as the Siberia, but the ship yard officials announced this week that El Alba will be launched at a later date. The North German Lloyd line steamship Main, which was rebuilt here, is now practically a new vessel, with not a mark to show the effects of the damage received in the great Hoboken fire, will leave in a few days for New York to resume her trips.

The North Atlantic squadron has returned to the Brooklyn navy yard. The battleships Alabama and Massachusetts left the southern drill ground ahead of the flagship Kearsarge, the last named returning to Hampton Roads in order that search could be concluded for a missing British admiral torpedo, valued at $1,000, which was lost in Lynnhaven bay. The torpedo has not been recovered and the Kearsarge has gone to New York. The battleships will be overhauled and put in readiness for the squadron's annual cruise in West Indian waters. The ships will return to Old Point before continuing to the West Indies in order to perfect the squadron organization. Several small cruisers and some of the torpedo boats will be added here, it is said.

Sir Christopher Furness, owner of ship yards, shipping lines and steel plants and mines in England, will visit Newport News six weeks hence. He arrived in New York recently and is now in Canada with a view of establishing a large ship yard at Sydney, C. B. He will go west in a few days, going as far as San Francisco, and will return to New York by way of Newport News. He is the managing director of the Chesapeake & Ohio Steamship Co., as well as the senior member of the firm of Furness, Withy & Co., both of which operate regular steamship lines from this port to London and Liverpool.

When the United States monitor Puritan was placed in dry dock at the navy yard several days ago, it was discovered that one of the blades of the port propeller was broken off close to the head. None of the officers or crew suspected there was anything wrong with the wheel and they do not know when the mishap occurred. She has been in service for some months at Annapolis as a practice vessel. Recently she made a trip to Washington and it is believed she struck some submerged object in the Potomac.

The steam engineering work on the cruiser San Francisco, which is being remodeled at the navy yard, has been completed and the ship is now being rewired and fitted with electrical attachments. Her commissioning has been delayed beyond the expectation of the navy department it is stated. The various departments of the navy yard are beginning to assume a busy appearance. Besides the San Francisco, the battleship Texas, the monitor Terror, several colliers and some of the torpedo boats are receiving attention The large steam collier Orion and the ocean tug Taurus, both of which ply regularly out of this port in the coal trade, the former carrying cargo and the latter towing, have been chartered to tow to Algiers, La., the $1,000,000 steel floating dry dock, which has just been completed at the Sparrow's Point (Md.) ship yard.

The British mule transport Kelvingrove, which had two explosions at sea, several of the crew being painfully injured, and which was overhauled at the ship yard, has proceeded to New Orleans to load mules for the British army in South Africa. The new Dutch steamship Amsteldyk, the second vessel for the Holland-America line, which now operates a regular line between Newport News and Amsterdam and Rotterdam, has been completed by Furness, Withy & Co. and arrived at Rotterdam from West Hartlepool. She will sail on Saturday for Newport News. The British steamship Drumgarth is at the ship yard for scraping, painting and inspection of machinery.

COBRA TOO LIGHTLY BUILT.

The inquest over the remains of the victims of the disaster to the turbine torpedo boat destroyer Cobra, which foundered in the North sea, Sept. 19, resulting in the loss of about seventy lives, has been concluded. A diver testified that he found the Cobra broken in two. The ends were jagged and looked like those of a cane broken across a person's knee. He could not find any trace of the Cobra having touched a sand bar or a wreck. She broke off close to one of her boilers. The stern half could not be discovered, though the diver searched for it 10 fathoms around. The jury rendered a verdict that the men were drowned through the unexplained buckling of the Cobra, and added a rider to the effect that the Cobra was too lightly built.

At their annual meeting a few days ago shareholders of the Canadian Pacific railway approved the proposition of the board of directors for the sale of bonds to the amount of £480,000, the proceeds of which are to be devoted to the purchase of the fleet of fourteen steamers of the Pacific Navigation Co. Besides that, three new steamers will be built, one for service on Lake Superior, the second for coast traffic on the Pacific ocean, and the third, a larger, faster and more modern boat, for the Empress line, the Canadian Pacific's trans-Pacific fleet. The company announced that $250,000 would be set aside as the nucleus of a pension fund for employees. The former board of directors was reelected.

BELLEVILLE GENERATORS

Grand Prix 1889 Hors Concours 1900
Originated 1849 Latest Improvements 1896

Number of Nautical Miles made each year by Steamships of the Messageries Maritimes Co., Provided with Belleville Generators—Since their Adoption in the Service.

Year.	Australien	Polynésien	Armand Béhic	Ville de la Ciotat	Ernest Simons	Chili	Cordillère	Laos	Indus	Tonkin	Annam	Atlantique
1890.....	67,728	2,460										
1891.....	68,247	68,331	204									
1892.....	68,247	68,403	69,822	23,259								
1893.....	68,379	68,343	68,286	68,247								
1894.....	68,439	68,367	68,574	68,439	37,701							
1895.....	68,673	68,766	68,739	68,808	40,887	28,713						
1896.....	69,534	92,718	69,696	69,549	62,205	63,153	40,716					
1897.....	68,250	69,606	92,736	69,555	62,235	76,110	63,357	43,146				
1898.....	70,938	69,534	69,552	69,597	62,526	63,240	63,240	62,553	63,954	22,707		
1899.....	69,534	69,615	67,431	90,405	60,246	62,778	62,868	52,344	54,855	44,007	22,884	
1900.....	69,534	67,494	69,744	69,564	61,719	62,382	62,502	51,471	53,373	62,016	63,066	52,140
Total.....	757,503	713,637	644,784	597,423	387,519	356,376	292,683	209,514	172,182	128,730	85,950	52,140

ATELIERS ET CHANTIERS DE L'ERMITAGE, À ST. DENIS (SEINE), FRANCE.
WORKS AND YARDS OF L'ERMITAGE AT ST. DENIS (SEINE), FRANCE.
TELEGRAPHIC ADDRESS: BELLEVILLE, SAINT-DENIS-SUR-SEINE.

SHIP YARD NOTES.

Frank Jay Gould has ordered a cruising steam yacht from the Gas Engine & Power Co. and Charles L. Seabury & Co., Consolidated, of Morris Heights, New York. The yacht will be of the following dimensions: Length over all, 185 ft.; beam, 22 ft.; draught, 10 ft. The vessel will be schooner rigged. There will be deck houses forward and aft, the former being sufficiently spacious to contain dining and smoking rooms, captain's stateroom and steward's pantry, while the latter will be fitted as a music room or social hall. Aft of the owner's quarters are the staterooms for guests.

A five-masted schooner on the stocks in the McKay & Dix yard at Bucksport, Me., has been named James W. Paul, Jr., and the date of the launch is now set for about Nov. 15. The vessel is 265 ft. keel. As soon as the Paul is launched the frame will be set up for a four-masted schooner of about 600 tons, for the cryolite trade, to take the place of the schooner Thalium of the McKay & Dix fleet recently wrecked.

The Townsend & Downey Ship Building & Repair Co., Shooter's Island, N. Y., has laid the keel for the steel schooner-yacht for the emperor of Germany. The steel frames from the Passaic Iron Works and the Tidewater Steel Co., Chester, Pa., are expected at the ship yard within a few days and the work will be rushed as fast as is consistent with good workmanship.

The schooner Baker Palmer, built by George L. Wert, Waldoboro, Me., for William F. Palmer of Boston, was launched last week. Her dimensions are: Length of keel, 262 ft.; beam, 46.6 ft.; depth, 26.6 ft.; gross tonnage, 2,792; net tonnage, 2,241. Her five Oregon pine masts are 110 ft. long with 60 ft. topmasts.

By the incorporation of the Standard Ship Building Co., Perth Amboy, N. J., the plant formerly owned and run by the late Hugh Ramsey will be put in active service. The capitalization is $200,000 and the shares are held by members of the Ramsey family.

Mr. David Clark launched from his yard at Kennebunkport, Me., recently the new schooner Savannah. Her dimensions are: Length over all, 188 ft.; length on keel, 161 ft.; breadth of beam, 35 ft. 6 in.; depth of hold, 13 ft. 2 in.

Work is progressing favorably on the four-masted schooner in the yard of Dunn & Elliott, Thomaston, Me. The keelson is nearly laid and the floor timbers have been prepared for the ceiling planks.

Keel for the new armored cruiser West Virginia has just been laid at the yards of the Newport News Ship Building & Dry Dock Co., Newport News, Va.

The compound marine engines, both fore and aft and vertical tandem, as built by Marine Iron Works, station A, Chicago, have met with considerable favor on the Atlantic and Gulf of Mexico coasts, that company having built eighteen sets of them for those waters so far this year. 4

The Joseph Dixon Crucible Co., Jersey City, N. J., has issued a little pamphlet upon graphite preparations for steam, gas and electric automobiles. It can be had for the asking.

"Steel Ships

THEIR CONSTRUCTION AND MAINTENANCE."

A valuable work, just from the press, by THOMAS WALTON, Author of "Know Your Own Ship."

Not highly technical, but well suited to Ship Superintendents, Marine Engineers, and Students of ship construction.

Introduction deals with steel from its crude state in ore to finished product in ship material. Then follows chapters dealing with principal structural features and alternative modes in which a vessel may be built. Largest section of the book treats in detail of the construction and combination generally of the various parts which go to make up the whole ship structure—framing, plating, stern frames and rudders, riveting, pumping and ventilation, and includes also remarks upon launching.

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E. T. EVANS, Western Manager, Buffalo, N. Y.

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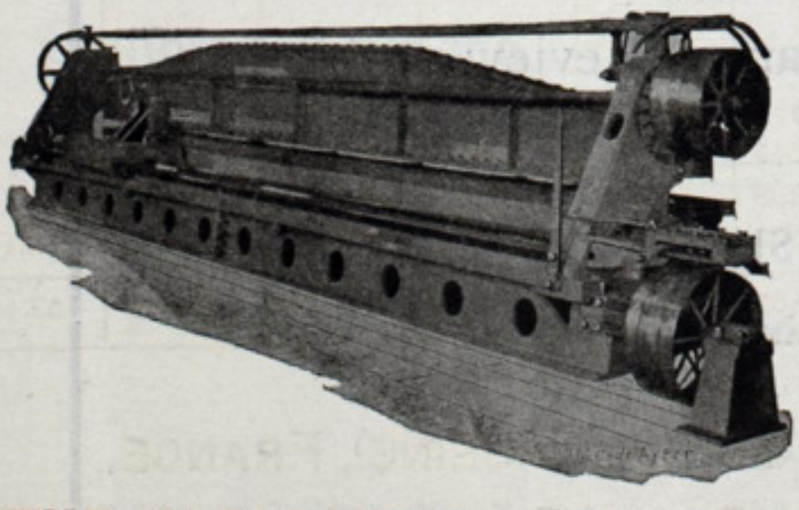

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$4,500 will purchase a splendid passenger steam ferry-boat at Owen Sound. Length 103 ft., beam 18 ft.; speedy and light on fuel; electrically lighted throughout. Canadian bottom, licensed to carry 336 passengers for rivers and bays. Personal inspection invited. Reason for selling, too small for present traffic. Purchaser can take possession at once. J. H. McLaughlin, Owen Sound, Can. Oct. 24.

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IN ALL SIZES FROM 1/8 TO 16" DIAMETER.

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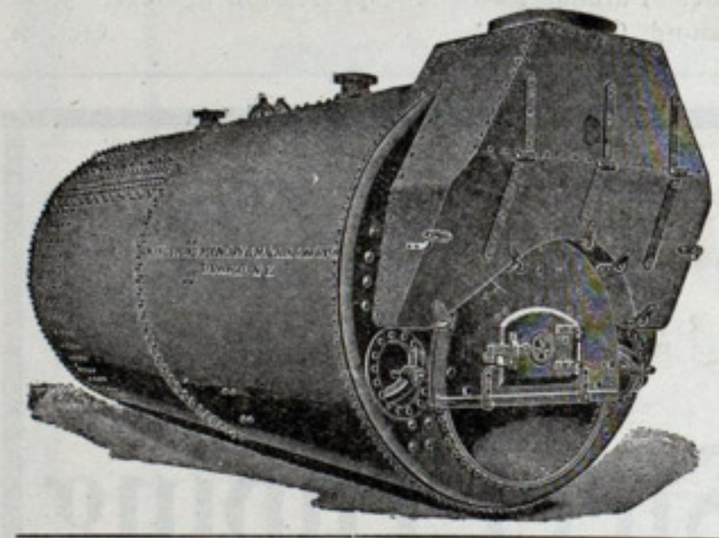

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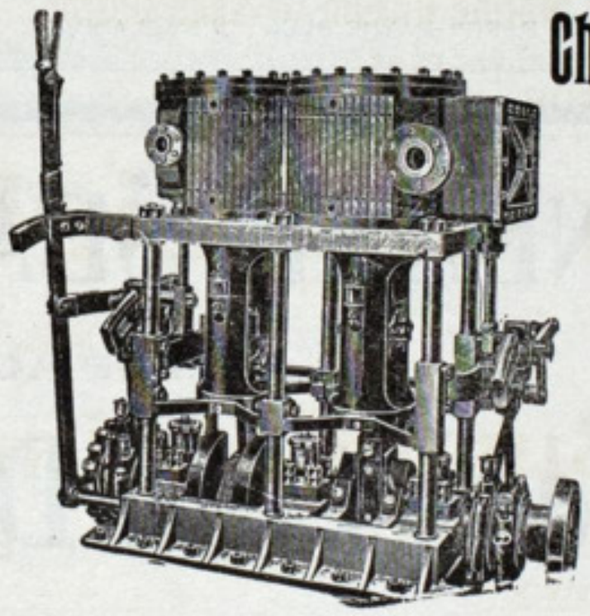

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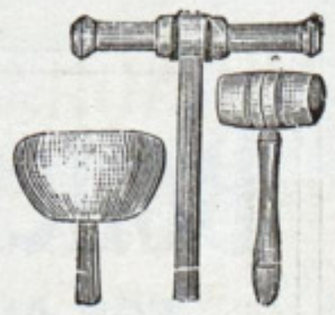

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INCREASES EVAPORATION 5 TO 15%.

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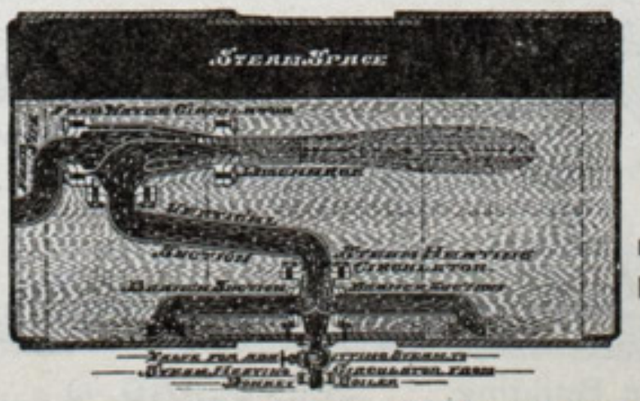

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No extra joints to leak.

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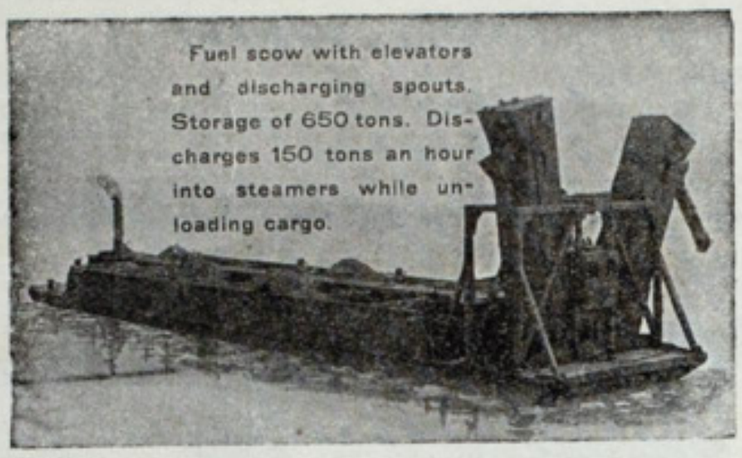

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3-12 INCH ROTARY.
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DIVING RIGS AND DIVERS ABOARD AT ALL TIMES

OCTOBER.						
S	M	T	W	T	F	S
...	...	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	...	...
...	...	...	...	...	...	...

10-100 TON JACKS
1-12 INCH HAWSER
1-10
1-9

Telegraph
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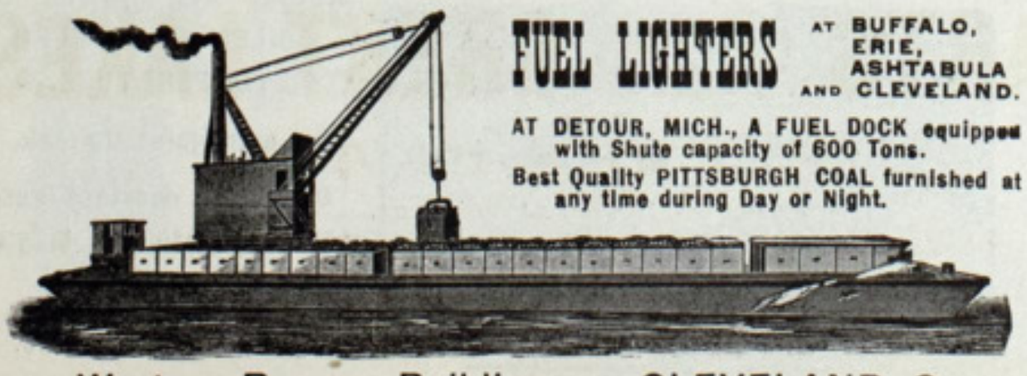

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AT DETOUR, MICH., A FUEL DOCK equipped with Shute capacity of 600 Tons.

Best Quality PITTSBURGH COAL furnished at any time during Day or Night.

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American Newspaper Directory.

Tells the circulations of all American newspapers. Revised, corrected and reissued every three months. Sixteen hundred pages: Price Five Dollars a volume or $20 a year.

BUFFALO.

We should hardly know how to get along without the American Newspaper Directory. We regard it by all odds the most complete and reliable guide that the advertiser can make use of; in fact, we use no other.

Buffalo, N. Y., July 24, 1901.
R. V. Pierce, M. D.,
President World's Dis. Med. Ass'n.

VERMONT.

The American Newspaper Directory stands, as it has always stood, the first and best of newspaper directories—the only one which cannot be ignored, the only one which every advertiser must have. No other can take its place; no other is needed—Joseph Auld, in the Burlington (Vt.) News of July 3, 1896.

ADVISOR.

The Advisor accepts the American Newspaper Directory as the standard in newspaper ratings. The obstacles which obstruct its efforts to get true and reliable information are many.

* * * *

The directory question is one which interests every publisher in the country—nay, the entire world. But in the United States directories are becoming altogether too numerous. In this, as with other books of reference, it is necessary to have one which may be relied on as being an authority on the matter of newspaper circulations. There can be no question about the fact that at this time, as for many years past, the American Newspaper Directory is that authority. The Advisor is not paid to make this announcement. It makes the statement in the interests of advertisers and publishers because it is true. One thing the advertiser is almost cock-sure of when he refers to the American Newspaper Directory is that the circulation figures he sees therein are not overstated to any great extent. In most other directories they are. Only the publisher himself is to be blamed for not securing a proper rating in that publication, and every advertiser of consequence knows it. Thus the publisher who refuses to furnish a statement places himself under a reasonable suspicion.—The Advisor for June.

New York, June, 1901.

CHICAGO.

Messrs. Geo. P. Rowell & Co.'s American Newspaper Directory has long since earned the reputation of being the best of its character. It contains the results of patient, expensive and systematic effort to secure all attainable information of interest concerning American newspapers. The work has been honestly done. This will not be questioned by any unprejudiced examiner. The most important question is circulation. In attempting to give this information the editor of the Directory encounters his most difficult work. It is the aim and necessity of the Directory to give the truth. The American Newspaper Directory is to-day the dependence and guide, in a greater or less degree, of every large advertiser in the country.—Chicago (Ill.) Daily News.

BATES.

The American Newspaper Directory is the only reliable guide for the advertiser.

No man who advertises can afford to do without it.

What Bradstreet and Dun are to the mercantile world the American Newspaper Directory is to the world of periodical publications.

A new advertiser will get from the American Newspaper Directory a better idea of the greatness of his country, and the tremendous possibilities in newspaper advertising, than from any other source.

If an advertiser spends only $100 a year he should have the American Newspaper Directory. For his business may grow and his right expenditure of his money become increasingly important. The time to learn how to spend $10,000 is before it is spent, otherwise the spending may be disastrous.

Many times the best paper in town costs the advertiser no more than the poorest. The American Newspaper Directory tells which is which.

The paper that was the leader in its town five years ago may lag behind today. Even one year may witness astonishing changes. If you are spending money for publicity it is vastly important that you should know where to get the most of it for the price. The American Newspaper Directory gives not only the present circulation rating of every paper in America, but shows their history by quoting past ratings.

The book costs five dollars a copy, and a single reference to it may readily save or make many times its cost.

All newspaper directories but one are erroneously optimistic about circulations. The American Newspaper Directory may occasionally err on the other side, but that makes it all the safer for the advertiser.

My advertising experience began in 1885, and one of the first things I did was to buy a copy of the American Newspaper Directory.

For sixteen years Rowell's "The American Newspaper Directory" has had a place of honor and usefulness on my desk.

Many a publisher is ready to prove by other directories that "Rowell's is wrong," but few indeed can be induced to prove it by opening their circulation books to the advertiser.

Among publishers who are not willing that their real circulations be known it is the best hated book in print. The moral is not far to find.

Charles Austin Bates.
New York, June 24, 1901.

PABST.

If the improvement of the American Newspaper Directory continues in the future as it has during the past twenty years I do not think I shall live long enough to see any other directory take its place. There will, however, be the usual crop of directories, just as every other good thing is imitated. Your long years of experience in dealing with evasive circulation reports have most admirably fitted you for placing a proper valuation upon such statements. Advertisers have come to know that the Rowell estimates are nearer the proper figure than can otherwise be obtained. The American Newspaper Directory is therefore indispensable in every well regulated advertising department. Lines are being more tightly drawn every day; it is difficult to collect for twenty thousand when you print only eight. If the advertiser were buying barley he would not accept three pecks for a bushel, although the quality might at all times be open for discussion.

The American Newspaper Directory is the guide and companion of the advertising man, and it is to the interests of all concerned to help perfect it, support it and hurrah for it.

Pabst Brewing Co.,
J. R. Kathrens, Adv. Mgr.
Milwaukee, Wis., June 7, 1901.

SAPOLIO.

A growing need created it—the advertising agency system. One of the earliest and most successful workers, Geo. P. Rowell, is still in the field. He originated methods. Others followed. A first early step in advance was his publication of a list of all the papers—the American Newspaper Directory. He has never ceased to love it, and labor for it. Soon, out of the gross stupidity of imitation, it became a rule that every agency down to those of Oshkosh or Oklahoma must issue its own directory. An awful waste, for not more than one out of ten was worth shelf room. If the National Association of Advertising Agents could agree long enough to buy Mr. Rowell's Directory, publish it officially and drop all the others, it would accomplish something.

Artemas Ward,
Advertising Manager for Sapolio.
—In Fame, March, 1901.

WASHINGTON.

Every page of the American Newspaper Directory breathes the desire of its publishers that it shall be absolutely correct in every statement it makes.

Truly yours, Frank Roe Batcheld,
Clerk of the Committee on Banking and Currency, House of Representatives, U. S.
Washington, D. C., Jan. 17, 1899.

SOUTHERN.

We subscribe to and pay cash for the American Newspaper Directory, and find it of great value in our advertising department. We have 6,892 miles of railway, extending from Washington, D. C., all over the South, and in advertising this system we use more than 1,000 publications, and in selecting this list we find that we get a correct idea of circulation from this Directory that can not be obtained from any other similar publication. We receive other newspaper directories gratis; but the fact that we pay cash for this one in addition shows that we can not place the same dependence upon the "free list."

We thoroughly appreciate the careful manner in which this Directory is compiled.

Washington, D. C., Sept. 13, 1900.
Jos. H. Hannen,
Adv. Dept. Southern Railway.

I am looking forward to receiving the new edition with a great deal of anticipation as, although the American Newspaper Directory seemed to have reached a high state of perfection several years ago, there is always something new and of value in each succeeding edition. It is regarded as the standard authority with the Southern Railway.

S. H. Hardwick,
General Passenger Agent.
Washington, D. C., May 21, 1901.

BALTIMORE.

We have used the American Newspaper Directory for many years and find it more valuable to us than any other similar publication. Much of the information given we cannot obtain in any other way. The book is not only a great help but a necessity to our business, and we think its way of stating circulations is the ideal one. A. C. Meyer & Co.,
Prop'rs of Dr. Bull's Cough Syrup, etc.
Baltimore, July 31, 1901.

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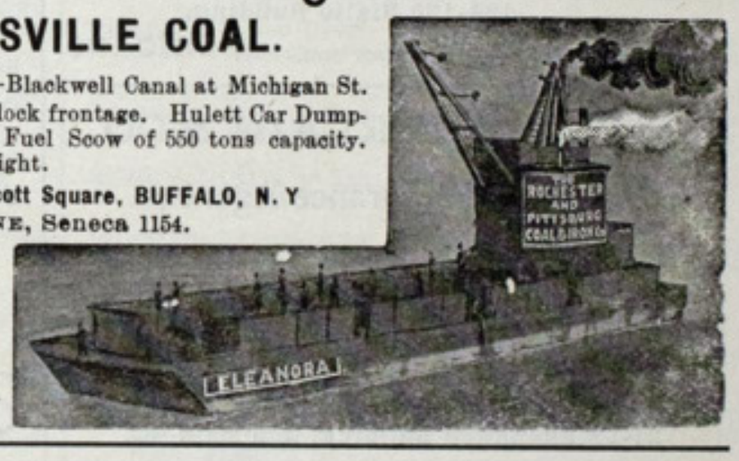

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Fore River Ship & Engine Co.....Quincy, Mass.
Gas Engine & Power Co.....Morris Heights, N. Y.
Hardy, John B.....Tacoma, Wash.
Harlan & Hollingsworth Co.....Wilmington, Del.
Hodge, S. F. & Co.....Detroit.
Jenks Ship Building Co.....Port Huron, Mich.
Kingsford Foundry & Machine Works.....Oswego, N. Y.
MacKinnon Mfg. Co.....Bay City, Mich.
Maryland Steel Co.....Sparrow's Point, Md.
Moran Bros. Co.....Seattle, Wash.
Neafie & Levy Ship & Engine Building Co..Philadelphia.
Newport News Ship Building Co.....Newport News, Va.
Nixon, Lewis.....Elizabeth, N. J.
Pusey & Jones Co.....Wilmington, Del.
Risdon Iron Works.....San Francisco.
Roberts Safety Water Tube Boiler Co.....New York.
Stirling, The Co.....Chicago.
Taylor Boiler Co.....Detroit.
Trigg, Wm. R. Co.....Richmond, Va.
Willard, Chas. P. & Co.....Chicago.

BOILER COMPOUNDS.

Dearborn Drug & Chemical Works.....Chicago.
Engel & Fagersten.....Chicago.

BOILER FURNACES, FIRE FRONTS, ETC.

Continental Iron Works.....New York.

BOILER RIVETS.

Bourne-Fuller Co.....Cleveland.
Champion Rivet Co.....Cleveland.

BOILER STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

BOLT CUTTERS.

Bement, Miles & Co.....Philadelphia.
Niles Tool Works Co.....Hamilton, O.

BORING AND TURNING MILLS.

Bement, Miles & Co.....Philadelphia.
Niles Tool Works Co.....Hamilton, O.

BRASS AND BRONZE CASTINGS.

Cramp, Wm. & Sons.....Philadelphia.
Fore River Ship & Engine Co.....Quincy, Mass.
Illinois Smelting & Refining Works.....Chicago.
Phosphor Bronze Smelting Co.....Philadelphia.

BRIDGES, BUILDERS OF.

Scherzer Rolling Lift Bridge Co.....Chicago.

BUCKETS, ORE AND COAL.

Brown Hoisting & Conveying Machine Co.....Cleveland.
McMyler Mnfg. Co.....Cleveland.

CABIN AND CABINET FINISHING WOODS.

Martin-Barriss Co.....Cleveland.

CAPSTANS.

American Ship Windlass Co.....Providence, R. I.
Hyde Windlass Co.....Bath, Me.

CHAINS.

Monongahela Iron & Steel Co.....Pittsburg.
Newhall Chain Forge & Iron Co.....New York.
Standard Chain Co.....Pittsburg.

CHAIN HOISTS.

Boston & Lockport Block Co.....Boston, Mass.

CHUCKING MACHINES.

Bement, Miles & Co.....Philadelphia.
Niles Tool Works Co.....Hamilton, O.

CHUCKS FOR LATHES, DRILLS AND PLANERS.

Skinner Chuck Co.....New Britain, Conn.

CIRCULATOR, EQUILIBRIUM, with Steam Heating Attachment.

Bloomsburg & Co., H.....Newport News, Va.

CLOCKS (Marine), CHRONOMETERS, BELLS.

Ashton Valve Co.....Boston.
Bliss, John & Co.....New York.
Ritchie, E. S. & Sons.....Brookline, Mass.

COAL PRODUCERS AND SHIPPERS.

Castner, Curran & Bullitt.....Philadelphia.
Hanna, M. A. & Co.....Cleveland.
Pickands, Mather & Co.....Cleveland.
Pittsburg Coal Co.....Cleveland.
Rochester & Pittsburgh Coal & Iron Co.....Buffalo.
Scott Co., The W. L.....Erie, Pa.

COAL AND ORE HANDLING MACHINERY.

Brown Hoisting Machinery Co., Incorporated..Cleveland.
Lidgerwood Mnfg. Co.....New York.
Robins Conveying Belt Co.....New York.

COMPASSES.

Bliss, John & Co.....New York.
Ritchie, E. S. & Sons.....Brookline, Mass.

CORK JACKETS AND RINGS.

Armstrong Cork Co.....Pittsburgh, Pa.
Kahnweiler's Sons, D.....New York.
Lane & DeGroot.....Brooklyn.

CRANES, CONVEYORS, HOISTS.

Brown Hoisting Machinery Co., Incorporated..Cleveland.
General Electric Co.....Schenectady, N. Y.
Lidgerwood Mnfg. Co.....New York.
Niles Tool Works Co.....Hamilton, O.
Robins Conveying Belt Co.....New York.
Westinghouse Electric & Mnfg. Co.....Pittsburg.
Wood & Co., R. D.....Philadelphia.

CRANK PINS.

Cleveland City Forge & Iron Co.....Cleveland.

DIVING APPARATUS.

Hale Rubber Co., Alfred.....So. Boston, Mass.
Schrader's Son, A.....New York.

DRILL PRESSES—DRILLS OF ALL KINDS.

Bement, Miles & Co.....Philadelphia.
Cleveland Punch & Shear Works Co.....Cleveland.
Niles Tool Works Co.....Hamilton, O.
Pond Machine Tool Co.....Plainfield, N. J.
Pratt & Whitney Co.....Hartford, Conn.

DRILLS, PNEUMATIC.

Standard Pneumatic Tool Co.....Chicago.

DRYING APPARATUS.

American Blower Co.....Detroit.
Boston Blower Co.....Hyde Park, Mass.
Sturtevant, B. F. Co.....Boston.

DRY DOCKS.

American Ship Building Co.....Cleveland.
Bath Iron Works, Ltd.....Bath, Me.
Buffalo Dry Dock Co.....Buffalo.
Chicago Ship Building Co.....Chicago.
Craig Ship Building Co.....Toledo, O.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Shipbuilding Co.....Detroit.
Harlan & Hollingsworth Co.....Wilmington, Del.
Lockwood Mnfg. Co.....East Boston, Mass.
Maryland Steel Co.....Sparrow's Point, Md.
Moran Bros. Co.....Seattle, Wash.
Newport News Ship Building Co.....Newport News, Va.
Nixon, Lewis.....Elizabeth, N. J.
Pusey & Jones Co.....Wilmington, Del.
Shipowners Dry Dock Co.....Chicago.

ELECTRIC LIGHT AND POWER PLANTS.

Badt-Goltz Engineering Co.....Chicago.
Buffalo Forge Co.....Buffalo.
Electro-Dynamic Co.....Philadelphia.
Elwell-Parker Electric Co.....Cleveland.
General Electric Co.....Schenectady, N. Y.
Seidler-Miner Electric Co.....Detroit.
Sturtevant, B. F. Co.....Boston.
Westinghouse Electric & Mnfg. Co.....Pittsburg, Pa.

ELECTRIC HOISTS AND CRANES.

Elwell-Parker Electric Co.....Cleveland.
General Electric Co.....Schenectady, N. Y.
Lidgerwood Mnfg. Co.....New York.
Westinghouse Electric & Mnfg. Co.....Pittsburg, Pa.

ELECTRIC STEERING GEAR, SPEED AND RUDDER INDICATORS, ETC.

Electro-Dynamic Co.....Philadelphia.

ENGINE BUILDERS, MARINE.

American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Bath Iron Works, Ltd.....Bath, Me.
Chicago Ship Building Co.....Chicago.
Chase Machine Co.....Cleveland.
Craig Ship Building Co.....Toledo, O.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Shipbuilding Co.....Detroit.
Farrar & Trefts.....Buffalo.
Fletcher, W. & A. Co.....Hoboken, N. J.
Fore River Ship & Engine Co.....Quincy, Mass.
Gas Engine & Power Co. and Chas. L. Seabury & Co., Consolidated.....New York.
Hardy, John B.....Tacoma, Wash.
Harlan & Hollingsworth Co.....Wilmington, Del.
Hodge, S. F. & Co.....Detroit.
Jenks Ship Building Co.....Port Huron, Mich.
Lake Shore Engine Works.....Marquette, Mich.
Lockwood Mnfg. Co.....East Boston, Mass.
MacKinnon Mfg. Co.....Bay City, Mich.
Maryland Steel Co.....Sparrow's Point, Md.
Moran Bros. Co.....Seattle, Wash.
Neafie & Levy Ship & Engine Bldg. Co.....Philadelphia.
Newport News Ship Building Co.....Newport News, Va.
Nixon, Lewis.....Elizabeth, N. J.
Olds Motor Works.....Detroit.
Pusey & Jones Co.....Wilmington, Del.
Risdon Iron Works.....San Francisco.
Roach's Ship Yard.....Chester, Pa.
Sheriffs Mnfg. Co.....Milwaukee.
Trigg, Wm. R. Co.....Richmond, Va.
Trout, H. G.....Buffalo.
Willard, Chas. P. & Co.....Chicago.

ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.

Cory, Chas. & Son.....New York.
Electro-Dynamic Co.....Philadelphia.
Seidler-Miner Electric Co.....Detroit.

ENGINEERING SPECIALTIES AND SUPPLIES.

Crane Co.....Chicago.
Reilly Repair & Supply Co., James.....New York.

ENGINEERS, MARINE AND MECHANICAL.

Electro-Dynamic Co.....Philadelphia.
Gaskin, Edward.....Buffalo.
Hunt, Robt. W. & Co.....Chicago.
Miller, Walter.....Cleveland.
Pittsburgh Testing Laboratory, Ltd.....Pittsburg.
Powell, Ambrose V.....Chicago.
Roelker, H. B.....New York.
See, Horace.....New York.
Wood, W. J.....Chicago.

EVAPORATING AND DISTILLING APPARATUS.

Reilly Repair & Supply Co., James.....New York.

FANS FOR VENTILATION, EXHAUST, ETC.

Boston Blower Co.....Hyde Park, Mass.
Buffalo Forge Co.....Buffalo.
Sturtevant, B. F. Co.....Boston.

FEED WATER PURIFIERS AND HEATERS.

Learmonth, Robert.....Buffalo.
Reilly Repair & Supply Co., James.....New York.
Reynolds, H. J.....Cleveland.
Smith, W. Blackburn.....Perth Amboy, N. J.

FIRE EXTINGUISHING APPARATUS.

Clayton Fire Extinguishing & Disinfecting Co.New York.

FIXTURES FOR LAMPS, OIL AND ELECTRIC.

Page Bros. & Co.....Boston.
Porter's Sons' Co., Wm.....New York.

FOG SIGNALS.

Colt Co., J. B.....New York.
Hamilton-Foster Fog Signal Co.....New York.

FORGES.

Buffalo Forge Co.....Buffalo.
Sturtevant, B. F. Co.....Boston.

FORGINGS FOR CRANK, PROPELLER OR THRUST SHAFTS, ETC.

Cleveland City Forge & Iron Co.....Cleveland.
Fore River Ship & Engine Co.....Quincy, Mass.

BUYERS' DIRECTORY OF THE MARINE TRADE.—Continued.

FURNACES FOR BOILERS.
Continental Iron Works.....New York.

FUELING COMPANIES AND COAL DEALERS.
Castner, Curran & Bullitt (Pocahontas).....Philadelphia.
Hanna, M. A. & Co.....Cleveland.
Pickands, Mather & Co.....Cleveland.
Pittsburg Coal Co.....Cleveland.
Rochester & Pittsburgh Coal & Iron Co.....Buffalo.
Scott Co., The W. L.....Erie, Pa.
Smith, Stanley B. & Co.....Detroit.
Youghiogheny & Lehigh Coal Co.....Chicago.

GAS BUOYS.
Safety Car Heating & Lighting Co.....New York.

GAS AND GASOLINE ENGINES.
Chase Machine Co.....Cleveland.
Lake Shore Engine Works.....Marquette, Mich.
Olds Motor Works.....Detroit.

GAGES, STEAM AND VACUUM.
American Steam Gauge Co.....Boston.
Ashton Valve Co.....Boston.
Crosby Steam Gage & Valve Co.....Boston.

GRAPHITE.
Dixon Crucible Co., Joseph.....Jersey City, N. J.

GRAPHITE BUSHINGS AND BEARINGS.
Graphite Lubricating Co.....Bound Brook, N. J.

HAMMERS, PNEUMATIC.
Standard Pneumatic Tool Co.....Chicago.

HAMMERS, STEAM.
Bement, Miles & Co.....Philadelphia.
Chase Machine Co.....Cleveland.
Niles Tool Works Co.....Hamilton, O.

HATCH GEARS.
"Long Arm" System Co.....Cleveland.

HAWSERS, WIRE.
American Steel & Wire Co.....Chicago.

HEATING APPARATUS.
Sturtevant, B. F. Co.....Boston.

HOISTS FOR CARGO, ETC.
American Ship Building Co.....Cleveland.
Brown Hoisting Machinery Co., Incorporated..Cleveland.
Chase Machine Co.....Cleveland.
Elwell-Parker Electric Co.....Cleveland.
General Electric Co.....New York.
Hodge, S. F. & Co.....Detroit.
Hyde Windlass Co.....Bath, Me.
Lidgerwood Mnfg. Co.....New York.
Marine Iron Co.....Bay City.
Westinghouse Electric & Mnfg. Co.....Pittsburg.

HOSE FOR PNEUMATIC TOOLS.
Sayen & Schultz.....Philadelphia.

HYDRAULIC MACHINERY.
Bement, Miles & Co.....Philadelphia.
Watson-Stillman Co., The.....New York.
Wood & Co., R. D.....Philadelphia.

ICE MACHINERY.
Roelker, H. B.....New York.

INDICATORS FOR STEAM ENGINES.
American Steam Gauge Co.....Boston.
Ashton Valve Co.....Boston.
Crosby Steam Gage & Valve Co.....Boston.

INJECTORS.
Crane Co.....Chicago.
Jenkins Bros.....New York.

INSURANCE, MARINE.
Brown & Co.....Buffalo.
Chamberlain & Co., S. R.....Chicago.
Drake & Maytham.....Buffalo.
Elphicke, C. W. & Co.....Chicago.
Helm, D. T. & Co.....Duluth, Minn.
Hutchinson & Co.....Cleveland.
Keith, J. G. & Co.....Chicago.
La Salle & Co.....Duluth.
Mitchell & Co.....Cleveland.
Osborn, F. H. & Co.....Chicago.
Parker, A. A. & W. B.....Detroit.
Peck, Chas. E. & W. F.....New York and Chicago.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago.
Tandy, Frank N.....Boston.

IRON ORE AND PIG IRON.
Bourne-Fuller Co.....Cleveland.
Hanna, M. A. & Co.....Cleveland.
Pickands, Mather & Co.....Cleveland.

IRON OR STEEL STAYBOLTS, HOLLOW OR SOLID.
Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

LATHES OF ALL KINDS.
Niles Tool Works Co.....Hamilton, O.
Pratt & Whitney Co.....Hartford, Conn.

LAUNCHES—NAPHTHA, ELECTRIC.
Gas Engine & Power Co.....New York.

LIFE PRESERVERS, LIFE BOATS, BUOYS, RAFTS, ETC.
Armstrong Cork Co.....Pittsburg.
Drein, Thos. & Son.....Wilmington, Del.
Kahnweiler's Sons, D.....New York.
Lane & DeGroot.....Brooklyn.

LIGHTS, SIDE AND SIGNAL.
Page Bros. & Co.....Boston.
Porter's Sons' Co., Wm.....New York.

LOGS.
Walker & Son, Thomas.....Birmingham, Eng.
Also Ship Chandlers.

MACHINE TOOLS (WOOD WORKING).
Atlantic Works, Inc.....Philadelphia.

MACHINE TOOLS.
Bement, Miles & Co.....Philadelphia.
Niles Tool Works Co.....Hamilton, O.
Pond Machine Tool Co.....Plainfield, N. J.
Pratt & Whitney Co.....Hartford, Conn.

MALLETS FOR CAULKERS, BOILER MAKERS, ETC.
N. Y. Mallet & Handle Works.....New York.

MARINE RAILWAYS, BUILDERS OF
Crandall & Son, H. I.....East Boston, Mass.

MATTRESSES, CUSHIONS, BEDDING.
Fogg, M. W.....New York.
Lein, Irvine & Co.....New York.

MECHANICAL DRAFT FOR BOILERS.
American Ship Building Co.....Cleveland.
Boston Blower Co.....Hyde Park, Mass.
Bloomsburg & Co., H.....Newport News, Va.
Buffalo Forge Co.....Buffalo.
Detroit Shipbuilding Co.....Detroit.
Sturtevant, B. F. Co.....Boston.

METALLIC PACKING.
Katzenstein, L. & Co.....New York.
U. S. Metallic Packing Co.....Philadelphia.

METALS FOR BEARINGS.
Cramp, Wm. & Sons.....Philadelphia.
Phosphor Bronze Smelting Co., Ltd.....Philadelphia.

METAL POLISH.
Bertram's Oil Polish Co.....Boston, Mass.

MILLING MACHINES OF ALL KINDS.
Bement, Miles & Co.....Philadelphia.
Niles Tool Works Co.....Hamilton, O.

NAUTICAL INSTRUMENTS.
Bliss, John & Co.....New York.
Ritchie, E. S. & Sons.....Brookline, Mass.

NAVAL ARCHITECTS.
Gaskin, Edward.....Buffalo.
See, Horace.....New York.
Wood, W. J.....Chicago.

OAKUM.
Stratford Oakum Co., Geo.....Jersey City, N. J.

OILS AND LUBRICANTS.
Dixon Crucible Co., Joseph.....Jersey City, N. J.
Standard Oil Co.....Cleveland.

PACKING.
Crane Co.....Chicago.
Garlock Packing Co.....Palmyra, N. Y.
Jenkins Bros.....New York.
Katzenstein, L. & Co.....New York.
Sayen & Schultz.....Philadelphia.
U. S. Metallic Packing Co.....Philadelphia.

PAINTS.
Baker, Howard H. & Co.....Buffalo.
Toch Bros.....New York.
Upson-Walton Co.....Cleveland.

PATENT ATTORNEYS.
Thurston & Bates.....Cleveland.

PATTERN SHOP MACHINERY.
Atlantic Works, Inc.....Philadelphia.

PIPE THREADING AND CUTTING MACHINES.
Merrell Mnfg. Co.....Toledo, O.

PIPE, WROUGHT IRON.
Bourne-Fuller Co.....Cleveland.
Crane Co.....Chicago.

PLANERS OF ALL KINDS.
Bement, Miles & Co.....Philadelphia.
Niles Tool Works Co.....Hamilton, O.

PLANING MILL MACHINERY.
Atlantic Works, Inc.....Philadelphia.

PLATE BENDING AND PLANING MACHINES.
Bement, Miles & Co.....Philadelphia.
Cleveland Punch & Shear Works Co.....Cleveland.
Niles Tool Works Co.....Hamilton, O.
Wood & Co., R. D.....Philadelphia.

PLUMBING, MARINE.
Reilly Repair & Supply Co., James.....New York.
Sands, Alfred B. & Son.....New York.

PNEUMATIC TOOLS.
Standard Pneumatic Tool Co.....Chicago.

POLISH FOR METALS.
Bertram's Oil Polish Co.....Boston.

PRESSURE REGULATORS.
D'Este Co., Julian.....Boston.

PROPELLER WHEELS.
American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Bath Iron Works, Ltd.....Bath, Me.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Shipbuilding Co.....Detroit.
Farrar & Trefts.....Buffalo.
Fore River Ship & Engine Co.....Quincy, Mass.
Hardy, John B.....Tacoma, Wash.
Hyde Windlass Co.....Bath, Me.
Harlan & Hollingsworth Co.....Wilmington, Del.
Hodge, S. F. & Co.....Detroit.
Jenks Ship Building Co.....Port Huron, Mich.
Lockwood Mnfg. Co.....East Boston, Mass.
MacKinnon Mfg. Co.....Bay City, Mich.
Maryland Steel Co.....Sparrow's Point, Md.
Moran Bros. Co.....Seattle, Wash.
Neafie & Levy Ship & Engine Bldg. Co.....Philadelphia.
Newport News Ship Building Co.....Newport News, Va.
Nixon, Lewis.....Elizabeth, N. J.
Phosphor Bronze Smelting Co., Ltd.....Philadelphia.
Pusey & Jones Co.....Wilmington, Del.
Risdon Iron Works.....San Francisco.
Roelker, H. B.....New York.
Sheriffs Mnfg. Co.....Milwaukee.
Trigg, Wm. R. Co.....Richmond, Va.
Trout, H. G.....Buffalo.

PROJECTORS, ELECTRIC.
Badt-Goltz Engineering Co.....Chicago.
Elwell-Parker Electric Co.....Cleveland.
General Electric Co.....Schenectady, N. Y.
Rushmore Dynamo Works.....Jersey City, N. J.
Seidler-Miner Electric Co.....Detroit.
Westinghouse Electric & Mnfg. Co.....Pittsburg.

PUMPS FOR VARIOUS PURPOSES.
Blake, Geo. F. Mnfg. Co.....New York.
Kingsford Foundry & Machine Works.....Oswego, N. Y.
Wood, R. D. & Co.....Philadelphia.
Worthington, Henry R.....New York.

PUNCHES, RIVETERS, SHEARS.
Bement, Miles & Co.....Philadelphia.
Cleveland Punch & Shear Works Co.....Cleveland.
Niles Tool Works Co.....Hamilton, O.
Wood, R. D. & Co.....Philadelphia.

REFRIGERATING MACHINERY.
Roelker, H. B.....New York.

REGISTER FOR CLASSIFICATION OF VESSELS.
Great Lakes Register.....Cleveland.

RELEASING HOOKS FOR DETACHING BOATS.
Standard Automatic Releasing Hook Co.....New York.

RIVETS, STEEL, FOR SHIPS AND BOILERS.
Bourne-Fuller Co.....Cleveland.
Champion Rivet Co.....Cleveland.

R. I. W. DAMP RESISTING PAINT.
Toch Bros.....New York.

RIGGING ROPE (WIRE).
American Steel & Wire Co.....Chicago.

RUBBER GOODS.
Hale Rubber Co., Alfred.....So. Boston, Mass.

RUBBER INSULATED WIRES.
Roebling's Sons, John A.....New York and Cleveland.
American Steel & Wire Co.....Chicago.

SAFETY VALVES.
American Steam Gauge Co.....Boston.
Ashton Valve Co.....Boston.
Crosby Steam Gage & Valve Co.....Boston.

SAIL MAKERS.
Baker, Howard H. & Co.....Buffalo.
Upson-Walton Co.....Cleveland.
Wilson & Silsby.....Boston.

SALVAGE COMPANIES.
See wrecking companies.

SEAM COMPOSITION AND ELASTIC SEAM PAINT.
Cole & Kuhls.....Brooklyn.

SEARCH LIGHTS.
Badt-Goltz Engineering Co.....Chicago.
Elwell-Parker Electric Co.....Cleveland.
General Electric Co.....Schenectady, N. Y.
Rushmore Dynamo Works.....Jersey City, N. J.
Seidler-Miner Electric Co.....Detroit.
Westinghouse Electric & Mnfg. Co.....Pittsburg.

SHAPERS.
Bement, Miles & Co.....Philadelphia.
Niles Tool Works Co.....Hamilton, O.
Pratt & Whitney Co.....Hartford, Conn.

SHEARS.
See punches, riveters and shears.

SHIP AND BOILER PLATES AND SHAPES.
Bourne-Fuller Co.....Cleveland.

SHIP BUILDERS.
American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Bath Iron Works, Ltd.....Bath, Me.
Buffalo Dry Dock Co.....Buffalo.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co.....Toledo, O.
Chicago Ship Building Co.....Chicago.
Detroit Shipbuilding Co.....Detroit.
Fore River Ship & Engine Co.....Quincy, Mass.
Hardy, John B.....Tacoma, Wash.
Harlan & Hollingsworth Co.....Wilmington, Del.
Jenks Ship Building Co.....Port Huron, Mich.
Lockwood Mnfg. Co.....East Boston, Mass.
Maryland Steel Co.....Sparrow's Point, Md.
Moran Bros. Co.....Seattle, Wash.
Neafie & Levy Ship & Engine Bldg. Co.....Philadelphia.
Newport News Ship Building Co.....Newport News, Va.
Nixon, Lewis.....Elizabeth, N. J.
Pusey & Jones Co.....Wilmington, Del.
Risdon Iron Works.....San Francisco.
Roach's Ship Yard.....Chester, Pa.
Trigg, Wm. R. Co.....Richmond, Va.
Willard, Chas. P. & Co.....Chicago.

SHIP CHANDLERS.
Baker, Howard H. & Co.....Buffalo.
Moran Bros. Co.....Seattle, Wash.
Reilly Repair & Supply Co., James.....New York.
Upson-Walton Co.....Cleveland.

BUYERS' DIRECTORY OF THE MARINE TRADE.—Continued.

SOUNDING APPARATUS.
Farr, C. W.....Chicago.

SPARS—LARGE SIZES.
Moran Bros. Co.....Seattle, Wash.

STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.
Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

STEAM VESSEL FOR SALE.
Holmes, Samuel.....New York.

STEAMSHIP LINES, PASS. AND FREIGHT.
Algoma Central Co.....Sault Ste. Marie, Ont.
American Line.....New York.
Cleveland & Buffalo Transit Co.....Cleveland.
Dominion Line.....Boston.
Erie & Western Trans. Co.....Buffalo.
International Nav. Co.....Philadelphia.
Red Star Line.....New York.

STEEL CASTINGS.
Seaboard Steel Casting Co.....Chester, Pa.

STEERING APPARATUS.
American Ship Building Co.....Cleveland.
Chase Machine Co.....Cleveland.
Detroit Shipbuilding Co.....Detroit.
Electro-Dynamic Co.....Philadelphia.
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co.....Port Huron, Mich.
Queen City Engineering Co.....Buffalo.
Sheriffs Mnfg. Co.....Milwaukee.

STOCKS, BONDS, SECURITIES.
Wright, Herbert & Co.....Cleveland.

STOCKLESS ANCHORS.
Baldt Anchor Co.....Chester, Pa.
International Anchor Co.....Cleveland.

SUBMARINE DIVING APPARATUS.
Hale Rubber Co., Alfred.....So. Boston, Mass.
Schrader's Son, A.....New York.

SURVEYORS, MARINE.
Gaskin, Edward.....Buffalo.
See, Horace.....New York.
Wood, W. J.....Chicago.

TELEGRAPH—DECK AND ENGINE ROOM.
Cory, Chas. & Son.....New York.

TESTS OF MATERIAL.
Hunt, Robert W. & Co.....Chicago.
Pittsburgh Testing Laboratory, Ltd.....Pittsburg.

THERMOMETERS FOR MECHANICAL PURPOSES.
Helios-Upton Co.....Peabody, Mass.

TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.
Bement, Miles & Co.....Philadelphia.
Cleveland Punch & Shear Works Co.....Cleveland.
New Doty Mnfg. Co.....Janesville, Wis.
Niles Tool Works Co.....Hamilton, O.
Pond Machine Tool Co.....Plainfield, N. J.
Pratt & Whitney Co.....Hartford, Conn.
Standard Pneumatic Tool Co.....Chicago.
Watson-Stillman Co.....New York.
Wood, R. D. & Co.....Philadelphia.

TOOLS, WOOD WORKING.
Atlantic Works, Inc.....Philadelphia.

TOPOPHONE—Prevents disasters in fogs.
Colt Co. J. B.....New York.

TOWING MACHINES.
American Ship Windlass Co.....Providence, R. I.
Chase Machine Co.....Cleveland.

TOWING COMPANIES.
Donnelly Salvage & Wrecking Co.....Kingston, Ont.
Midland Towing & Wrecking Co., Ltd.....Midland, Ont.
Swain Wrecking Co.....Detroit.

TRAPS, STEAM.
D'Este Co., Julian.....Boston.
Haines Co., Wm. S.....Philadelphia.

TRUCKS.
Boston & Lockport Block Co.....Boston.

TUBING, SEAMLESS.
Benedict & Burnham Mnfg. Co.....Waterbury, Conn.
Standard Seamless Tube Co.....Pittsburg.

VALVES, STEAM SPECIALTIES, ETC.
American Steam Gauge Co.....Boston.
Ashton Valve Co.....Boston.
Crane Co.....Chicago.
Crosby Steam Gage & Valve Co.....Boston.
D'Este Co., Julian.....Boston.
Jenkins Bros.....New York.
Wood & Co., R. D.....Philadelphia.

VARNISH PAINT.
Mair, John & Son.....Philadelphia.

VESSEL AND FREIGHT AGENTS.
Boland, John J.....Buffalo.
Brown & Co.....Buffalo.
Chamberlain & Co., S. R.....Chicago.
Drake & Maytham.....Buffalo.
Elphicke, C. W. & Co.....Chicago.
Hall & Root.....Buffalo.
Helm, D. T. & Co.....Duluth, Minn.
Holmes, Samuel.....New York.
Hutchinson & Co.....Cleveland.
Keith, J. G. & Co.....Chicago.
Kennedy Hunter & Co.....Antwerp.
Mitchell & Co.....Cleveland.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago.
Tandy, Frank N.....Boston.

VENTILATING APPARATUS FOR SHIPS.
Boston Blower Co.....Hyde Park, Mass.
Buffalo Forge Co.....Buffalo.
Sturtevant, B. F. Co.....Boston.

WIRE ROPE AND WIRE ROPE FITTINGS.
American Steel & Wire Co.....Chicago.
Baker, H. H. & Co.....Buffalo.
Roebling's Sons, John A.....New York and Cleveland.
Upson-Walton Co.....Cleveland.

WHISTLES, STEAM.
American Steam Gauge Co.....Boston.
Ashton Valve Co.....Boston.
Crosby Steam Gage & Valve Co.....Boston.

WINDLASSES.
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American Ship Building Co.....Cleveland.
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co.....Port Huron, Mich.

WINCHES.
American Ship Windlass Co.....Providence, R. I.
Hyde Windlass Co.....Bath, Me.

WOOD WORKING MACHINERY.
Atlantic Works, Inc.....Philadelphia.

WRECKING AND SALVAGE COMPANIES.
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Midland Towing & Wrecking Co., Ltd.....Midland, Ont.
Swain Wrecking Co.....Detroit.

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YACHT AND BOAT BUILDERS.
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Gas Engine & Power Co.....New York.
Lane & DeGroot.....Brooklyn.
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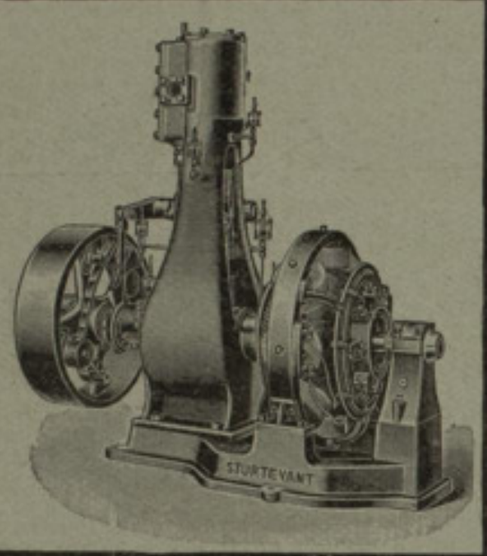

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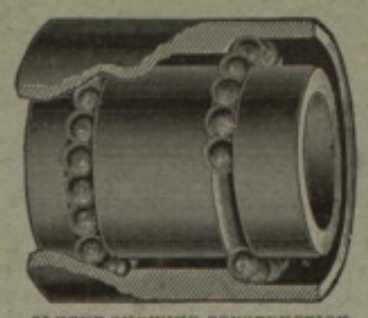

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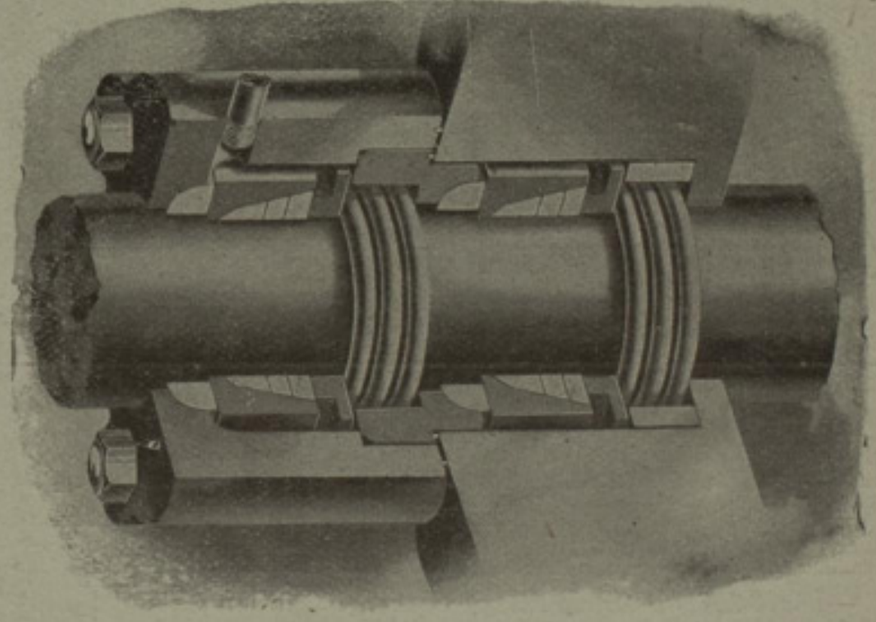

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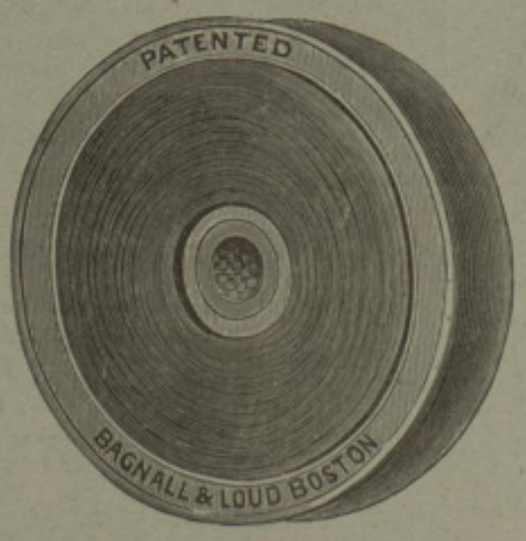

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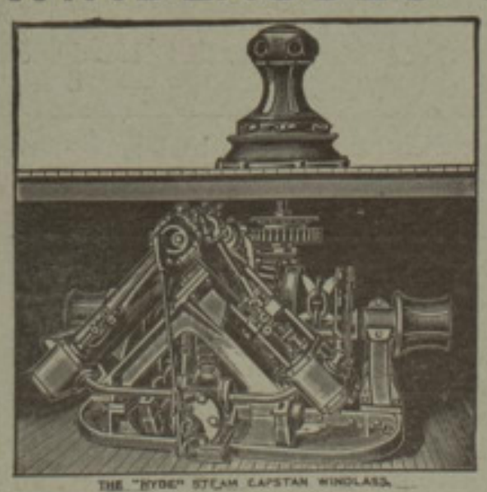

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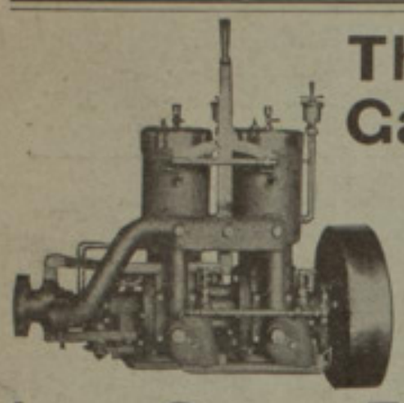

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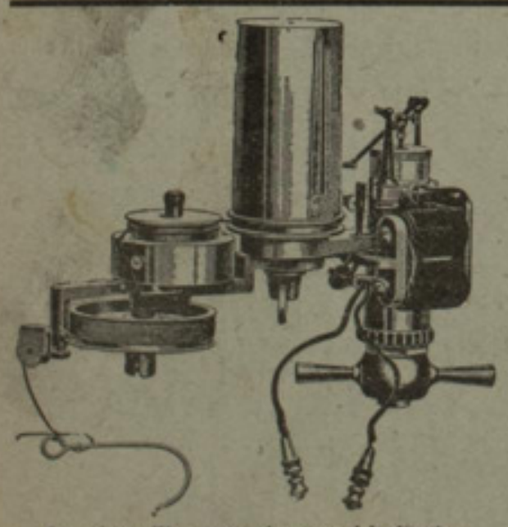

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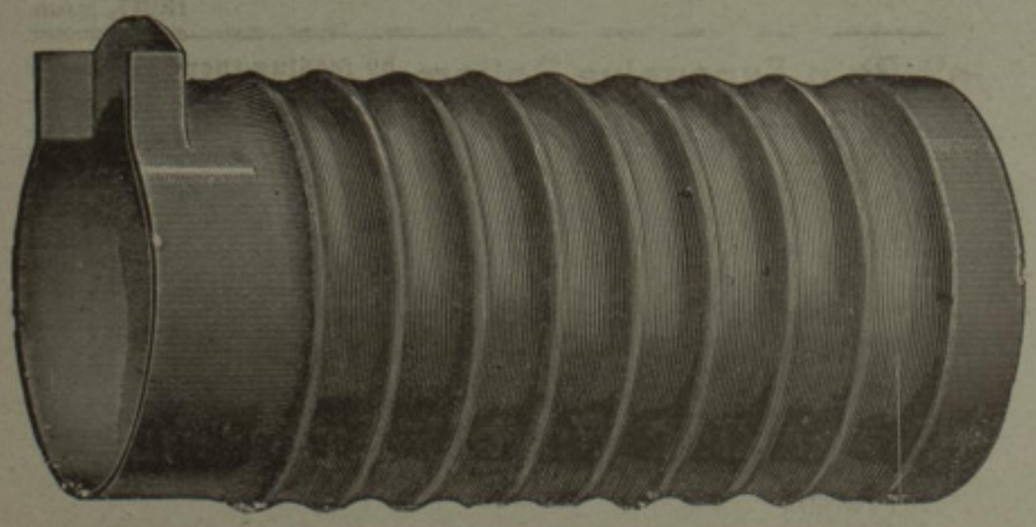

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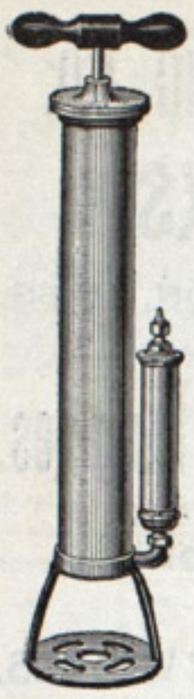

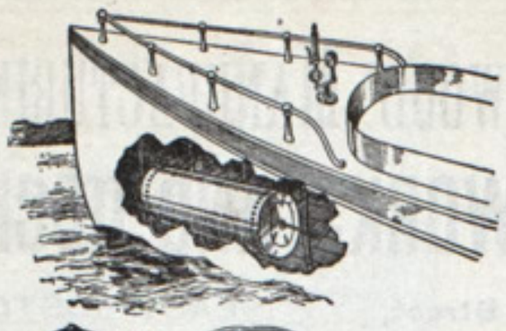

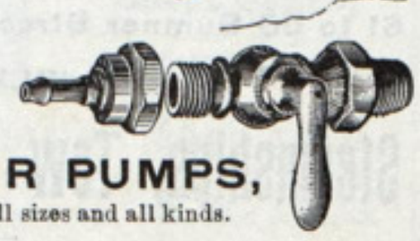

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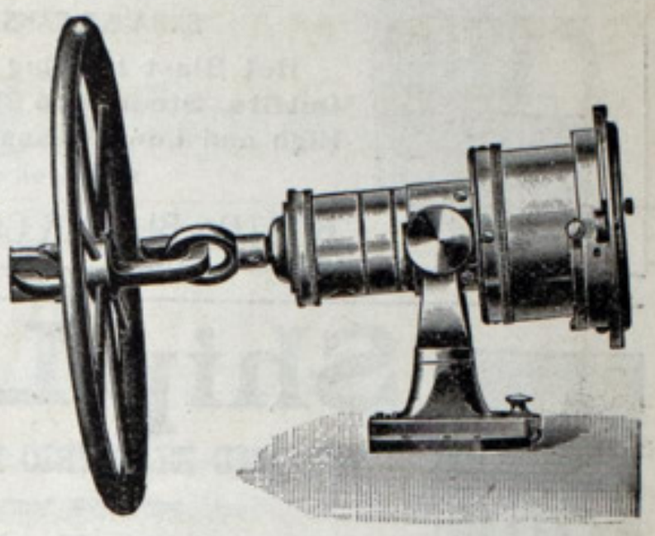

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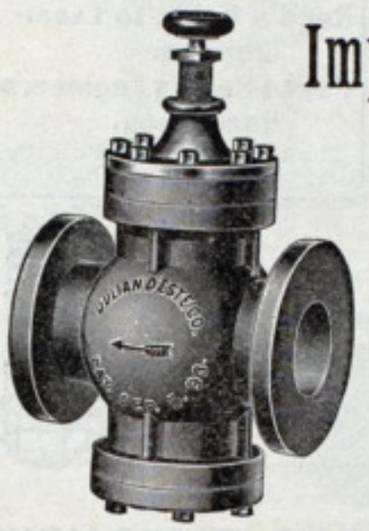

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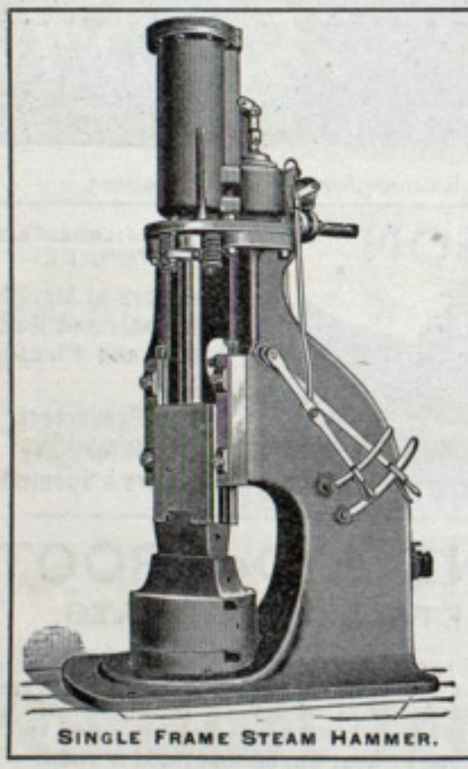

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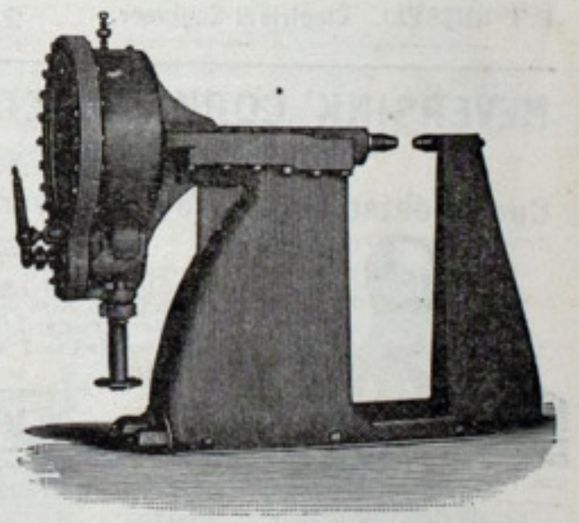

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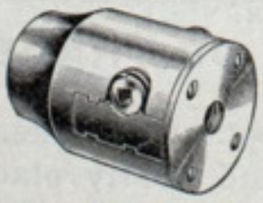

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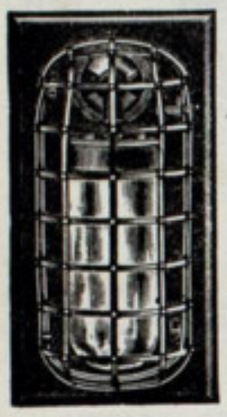

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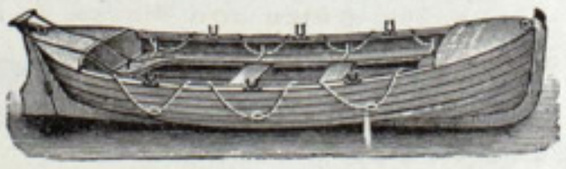

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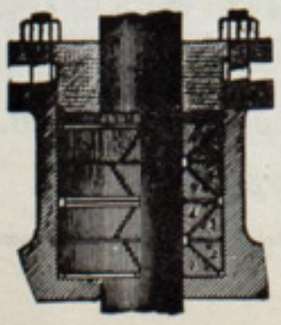

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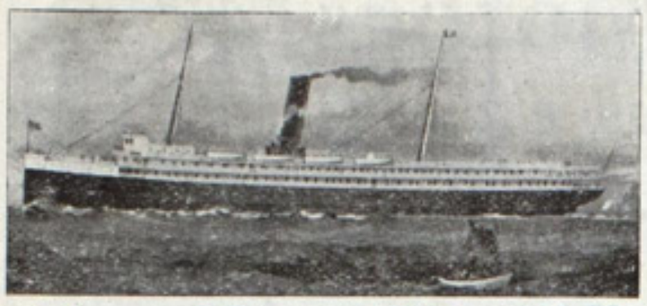

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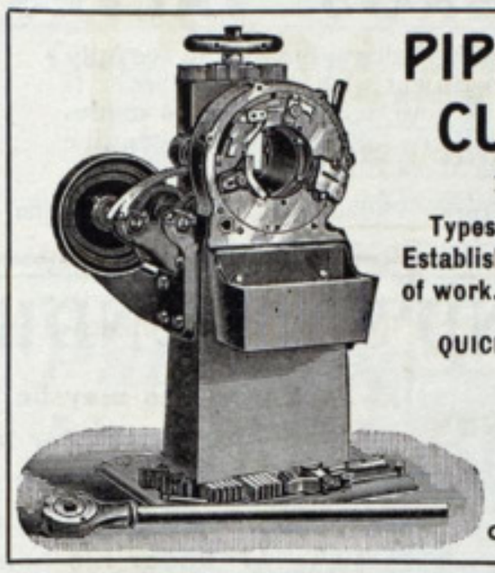

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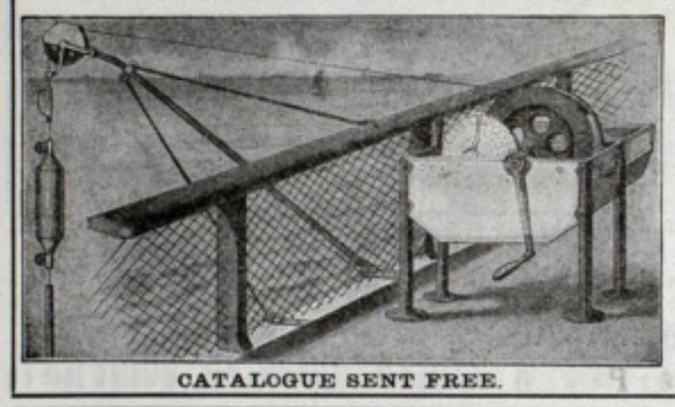

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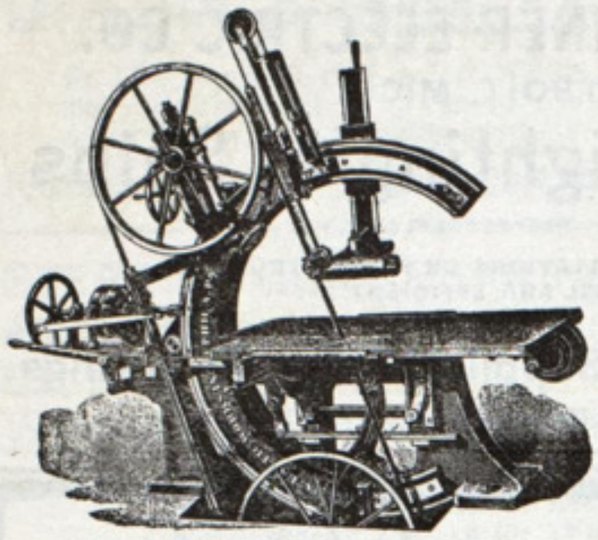

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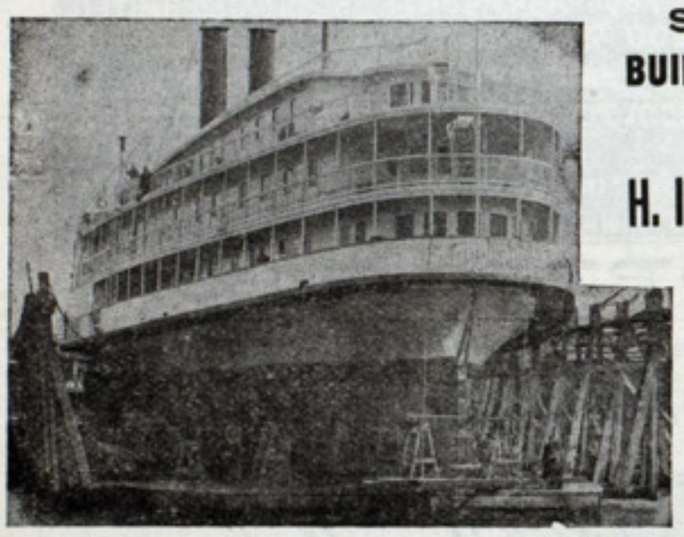

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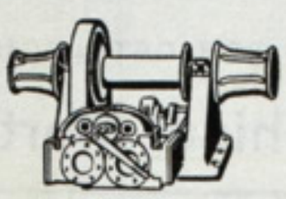

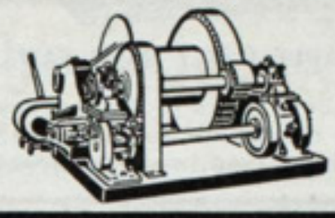

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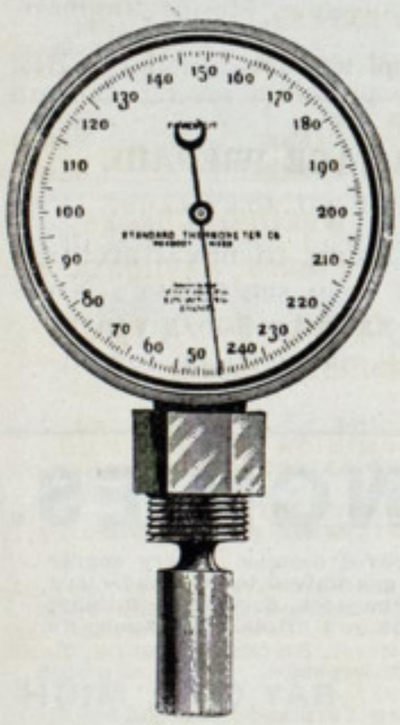

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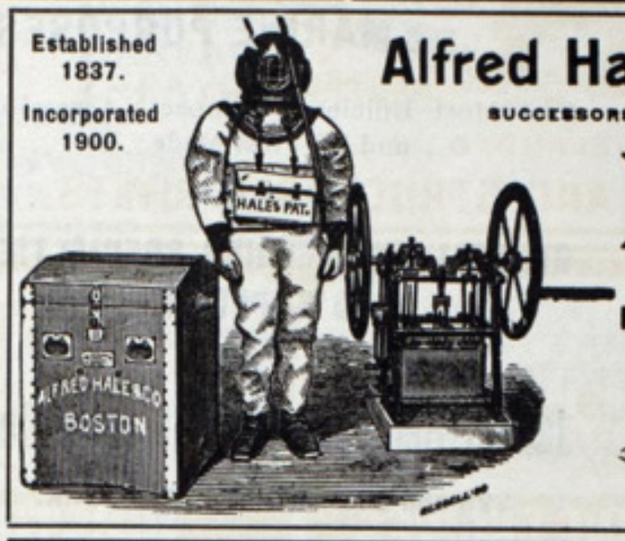

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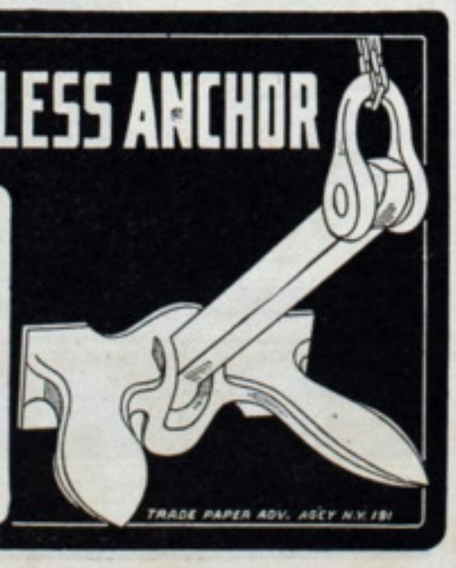

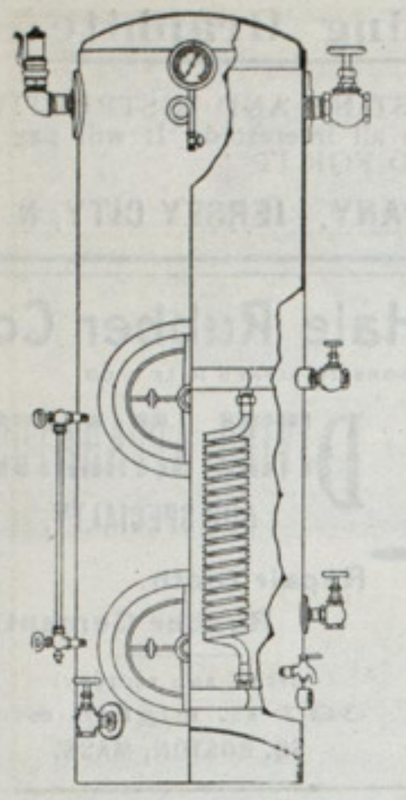

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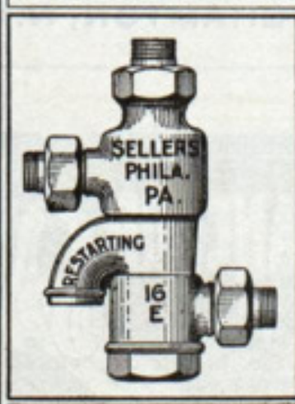

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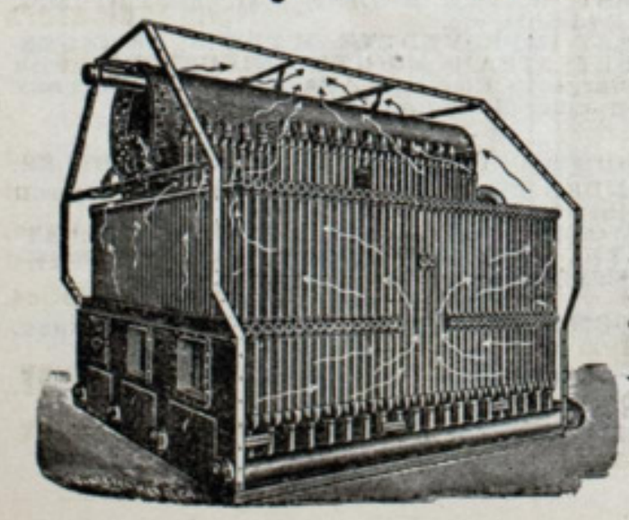

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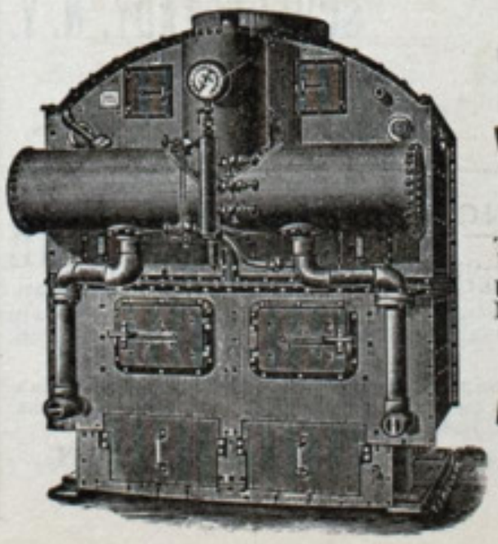

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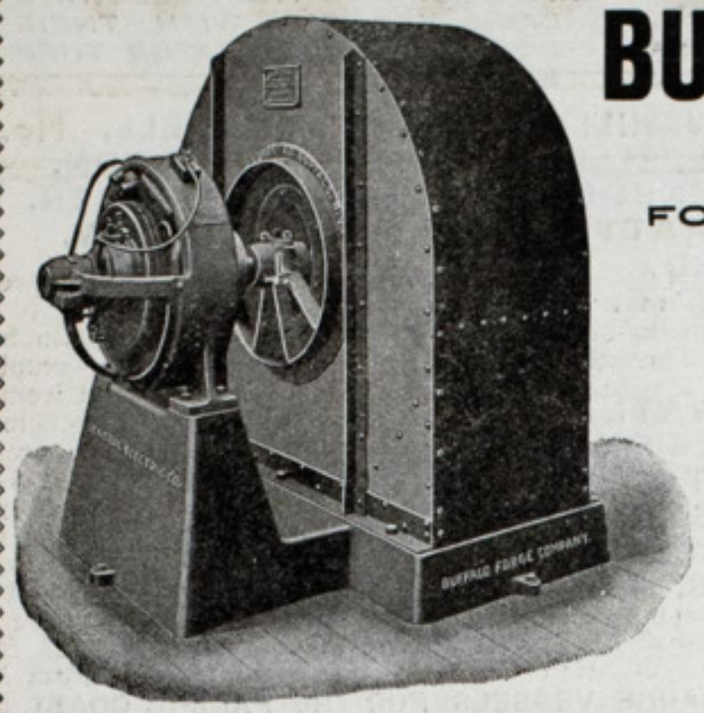

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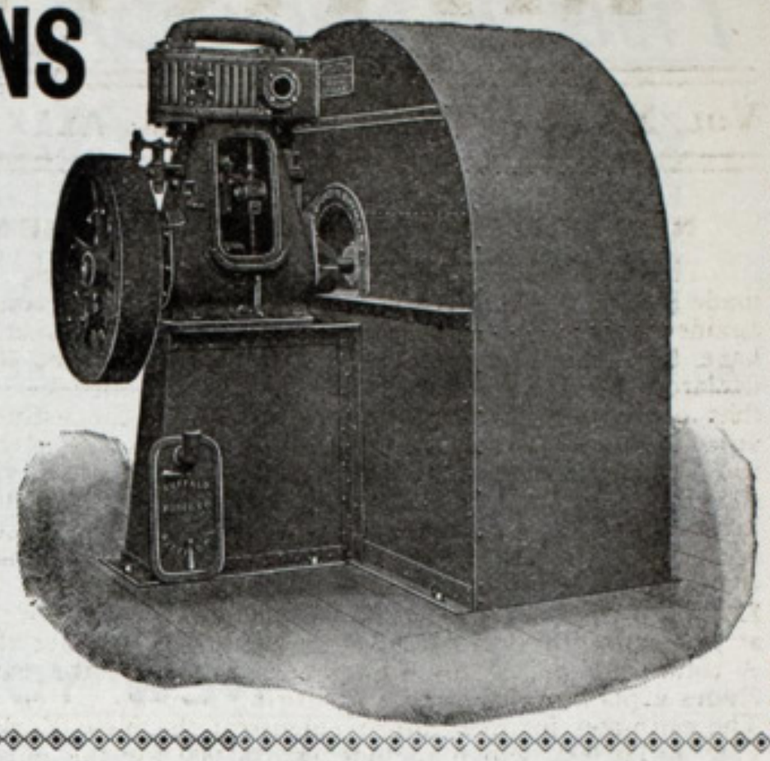

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